

# Highland Environmental Management

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May 14, 2001

David L. Broste (8ENF-T)  
U.S. Environmental Protection Agency  
Region VIII  
999 18<sup>th</sup> Street, Suite 300  
Denver, Colorado 80202-2466

**Re: Rico-Argentine Site**

Dear Mr. Broste:

This letter is submitted on behalf of NL Industries, Inc. ("NL") in response to the United States Environmental Protection Agency's ("US EPA") Request for Information ("Request") dated March 7, 2001 pursuant to Section 104(e) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. §9604, as amended, regarding the Rico-Argentine Site located near Rico, Colorado. NL received the Request for Information on March 15, 2001. Pursuant to the letter dated April 9, 2001 from me to you, NL was granted an extension of time to respond to May 14, 2001.

Nothing in this response shall constitute an admission of liability by NL for the Site, and NL reserves its right to contest any allegations made against it with regard to this Site by any person or entity. By responding to the Request, NL does not intend to waive any applicable privilege, including but not limited to, the attorney-client privilege and the attorney-work product privilege.

NL states that documents, some of which may have been responsive to questions contained in the Request, may have been disposed of in accordance with the normal business practices of NL prior to the receipt of the Request. The Request seeks information regarding events that happened over 70 years ago. NL has no current employees with contemporaneous knowledge of the events covered by the Request. As a result, NL can only respond to the extent that it still has documents that may contain responsive information. NL is not obligated to, nor will NL, attempt to characterize or describe information contained in the enclosed documents. NL does not vouch for the truth, accuracy or completeness of any information contained in the enclosed documents.

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Mr. David L. Broste  
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Rico-Argentine Site

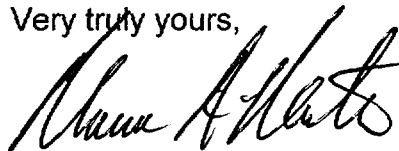
NL is submitting its response subject to and without waiving the following objections to the Instructions contained within the Request. NL notes that the US EPA has not identified any relevant time period for the Request. NL will make every effort to respond with respect to the broadest time period for which it has knowledge, it can only respond to the Request for the time period covered by available records. NL objects to any question that seeks information about sites other than the Rico-Argentine Site.

NL objects to the Instructions to the extent they require NL to identify sources of information not in its possession, custody or control. NL also objects to those Instructions requiring it to seek out former employees, officers, directors and agents in order to obtain information. Such information as may be available to any former employees, to the extent such former employees still exist, is not in the possession, custody or control of NL. NL is not required to seek out former employees etc. to respond to the Request, nor does it have the authority to require former employees and agents, or former employees and agents of other companies, to provide information.

NL further objects to the Instructions to the extent they require NL to produce documents that would be protected from disclosure by the attorney-client privilege, attorney-work product, or other applicable privilege. NL states that it will not produce such documents in response to the Request.

NL further objects to the Request to answer on "parent companies" and "partners" since those terms are vague and NL has no authority to provide information on behalf of such entities. Notwithstanding the foregoing objections, NL submits the attached responses to the Request. Please feel free to contact me if you have any questions.

Very truly yours,

A handwritten signature in black ink, appearing to read "Marcus A. Martin", written in a cursive style.

Marcus A. Martin

**NL INDUSTRIES' RESPONSES TO CERCLA 104(e) REQUEST  
FOR INFORMATION ON THE RICO-ARGENTINE SITE NEAR RICO,  
COLORADO**

**Response to Request 1**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. Subject to this objection, NL states as follows:

Marcus A. Martin  
Highland Environmental Management, LLC  
1630 30<sup>th</sup> Street, Suite 598  
Boulder, Colorado 80301  
Telephone: 303.442.3950

**Response to Request 2**

See NL's response to Request 1.

**Response to Request 3**

Documents consulted in preparation of these Requests are attached to this response or were previously submitted to US EPA, as described in response to Request 10.

**Response to Request 4**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. In addition, NL objects to this Request as vague, overly broad, unduly burdensome and intended to harass NL. NL can respond to this Request only to the extent it still has documents that may contain responsive information. NL is not required to characterize or describe the contents of such documents. Subject to these objections, NL has attached all documents in its possession that may be responsive to this Request. NL does not vouch for the accuracy or completeness of these documents.

**Response to Request 5**

See NL's response to Request 4.

**Response to Request 6**

NL objects to this Request as vague, overly broad, unduly burdensome and intended to harass NL. Subject to this objection, NL states that it has no

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such information.

#### **Response to Request 7**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. In addition, NL objects to this Request as vague, overly broad, unduly burdensome and intended to harass NL. NL can respond to this Request only to the extent it still has documents that may contain responsive information. NL is not required to characterize or describe the contents of such documents. Subject to these objections, NL has attached all documents in its possession that may be responsive to this Request. NL does not vouch for the accuracy or completeness of these documents.

#### **Response to Request 8**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. In addition, NL objects to this Request as vague, overly broad, unduly burdensome and intended to harass NL. Subject to these objections, NL states that it has no current property interests at the Site. With respect to former property interests, NL can respond to this Request only to the extent it still has documents that may contain responsive information. NL is not required to characterize or describe the contents of such documents. NL has attached all documents in its possession that may be responsive to this Request. NL does not vouch for the accuracy or completeness of these documents.

#### **Response to Request 9**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. Subject to this objection, NL states that it has no knowledge or information to respond to this Request.

#### **Response to Request 10**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. In addition, NL objects to this Request as vague, overly broad, unduly burdensome and intended to harass NL. In addition, NL objects to this Request as duplicative of prior requests by US EPA to NL. NL submitted responses to the US EPA's requests for information dated September 24, 1991 and January 28, 1992 responding to this same question relating to the St. Louis Smelting and Refining Company's alleged relationship to NL. NL's responses were addressed to Mr. David L. Broste at US EPA Region VIII in Denver, Colorado. NL is under no obligation to provide



responsive information that was previously provided to US EPA pursuant to CERCLA 104(e) that is already within the possession and custody of US EPA.

**Response to Request 11**

See NL's response to Request 10.

**Response to Request 12**

See NL's response to Request 10.

**Response to Request 13**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. NL objects to this Request as unintelligible and as not susceptible to a rational response. Subject to this objection, the National Lead Company changed its name to "NL Industries, Inc." in 1971.

**Response to Request 14**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. Subject to this objection, NL states that it has no knowledge or information of any such persons.

**Response to Request 15**

NL objects to this Request since it requests information that exceeds the US EPA's statutory authority under Section 104(e) of CERCLA. Subject to this objection, NL states that it has no knowledge or information of any such person.

The Rico-Wellington Mining Company survived the previous twenty years of adversity as the district's most significant and consistent producer only to find new and expanding companies asserting themselves during the boom period of 1925-1929. One such company was the Rico Mining & Reduction Company, which incorporated in August 1925. The company quickly obtained lease options on properties of the Rico Consolidated Mines Company and purchased the properties of the Rico-Wellington Mining Company.<sup>48</sup> Rico Mining & Reduction worked the Rico Consolidated properties during 1925, but relinquished its lease after that. The company then turned its attention to the Rico-Wellington properties located on C.H.C. Hill, the Argentine shaft, and preparations for a flotation mill.<sup>49</sup> The mill never materialized, but the company's other holdings attracted interest. The St. Louis Smelting and Refining Company, a subsidiary of the National Lead Company, acquired all holdings and property of Rico Mining & Reduction in May 1927.<sup>50</sup> St. Louis acquired a lease on the Mountain Spring mine, located on C.H.C. Hill, that year, also. Three years later, the company started the St. Louis tunnel into the base of the hill to prospect formations below the Mountain Springs mine. The company drove the tunnel more than 5,000 feet into the hill, but abandoned it

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<sup>48</sup>(RIC000000791), 848-849, and "Report to Bureau of Mines," Colorado Bureau of Mines, 1929, Historic Mines Reports, Box 104038, File: Wellington, Colorado State Archives (RIC000000050).

<sup>49</sup>"Rico Mining & Reduction Co. Builds Flotation Plant," *Engineering & Mining Journal*, 28 November 1925, 864 (RIC000000701).

<sup>50</sup>(RIC000001124), 546.

*Handwritten:* Rico Mining & Reduction Co. built the flotation plant on C.H.C. Hill, the Argentine shaft, and preparations for a flotation mill.

when the ore proved to be less rich than expected.<sup>51</sup> Despite its failure, both the tunnel and the company survived several more years at Rico.

Production from the district during the boom period amounted to about 200,000 tons of ore as compared to about 125,000 tons produced from 1901 to 1924. Rico Argentine produced about a third of the total with the remaining production fairly evenly divided between Pelleyre, St. Louis (and its predecessor Rico Mining & Reduction), and Falcon Lead Mining.<sup>52</sup> Production in the district dropped slightly in 1929 after the closure of the International mill in 1928, but the real drop came with the stock market crash in October of that year. By 1932, mining operations in the district produced almost nothing. Production rebounded slightly in 1935, but fell off again in subsequent years. The district did not begin to recover until 1938 when new management at the Rico Argentine Mining Company and new hope on the economic front provided incentive for a resurgence.

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<sup>51</sup>(RIC000000088), 99.

<sup>52</sup>(RIC000002119), 6, and "Report to the Bureau of Mines," 1901-24, Colorado Bureau of Mines, Historic Mine Reports, Boxes 104037 and 104038, Files: Atlantic Cable, Phoenix, Pro Patria, St. Louis, Shamrock, Wellington, and Yellow Jacket, Colorado State Archives. There are too many document numbers to list all of them here.

## Rico Mining and Reduction Company and Successors

The Rico Mining and Reduction Company (see A-8) incorporated in Colorado in August of 1925.<sup>22</sup> In May, 1927, the company was acquired by the St. Louis Smelting & Refining Company.<sup>23</sup> St. Louis Smelting and Refining was a subsidiary of the National Lead Company, which had acquired St. Louis in 1897.<sup>24</sup> St. Louis was a major producer in the Rico district from 1927 thru 1929 when the Great Depression curtailed most activity in the district. The company held onto its properties, though the company conducted little mining activity, until 1943, at which time they relinquished all leases and options in the district.<sup>25</sup> Rico Mining Reduction continued to be listed as a viable entity by the Colorado Secretary of State's office until 1945, but it appears that the company did not produce any ore after 1927. National Lead Company changed its name to NL Industries, Inc. on April 15, 1971.<sup>26</sup> NL Industries remains a viable entity.

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<sup>21</sup>Index to Foreign and Domestic Annual Statements 1931-1935, MET thru U, Office of Secretary of State, Colorado State Archives.

<sup>22</sup>(RIC000000791), 848-849.

<sup>23</sup>(RIC000001124), 546.

<sup>24</sup>Moody's Industrial Manual, 1969 (NY, NY: Moody's Investors Service, 1969), 1562 (RIC000002371).

<sup>25</sup>(RIC000000088), 100.

<sup>26</sup>Moody's Industrial Manual, 1993, Vol. 2 (NY, NY: Moody's Investor Service, 1993), 6051 (RIC000002383).

# THE MINES HANDBOOK

SUCCEEDING

## THE COPPER HANDBOOK

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THE MINING COMPANIES OF THE  
TWO AMERICAN CONTINENTS

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*Published by*  
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SUFFERN, NEW YORK

RIC000000791

**FAIRVIEW MINING CORPORATION****COLORADO**

Address: Frank M. Holmes, 225 First Nat. Bank Bldg., Denver, Colo.

Mine address: W. H. Webber, mgr., Nederland, Colo.

Officers: John E. Bergen, pres.; W. H. Winterbotham, v. p.; F. M. Holmes, sec.-treas.; with Orvill Beal, Leon Kepler, B. F. Hastings and Hugo Eymann, directors.

History and capitalization: INC. in Colorado. Has a bond and lease on the Boulder county mine and tunnel, which was formerly operated by the now defunct Caribou Metals Co. Involved in litigation with American Mines & Smelting Co., which see. Also operated the Fairview mine since 1922 and the Gilpin County mine in 1922. CAP: \$500,000; \$1 par; 140,000 treasury shares. Operating expenses in 1925 were \$110,000 and receipts from ore sales \$45,000. Annual meeting in January. Stock transferred at company's office.

Property: 25 claims (15 patented), about 450 acres, at Cardinal, Grand Island district, Boulder county. Ore occurs in quartz vein in schist and carries gold, silver, lead and zinc.

Development: by a 150' shaft and 5,900' Boulder County main tunnel, of which 3,200' is crosscut, to a depth of 1,200'. Workings total about 10,000'. Ore reserves show 28,000 tons of \$10 to \$15 ore blocked out and 500,000 tons of possible ore.

Equipment: includes electric power, 753 cu. ft. compressor, hoist and 150-ton concentration mill, using selective flotation. About 58 men were employed.

Through 1927 and 1928 company operated steadily and made regular shipments. Litigation in 1929 halted operations. We have been unable to get direct information as to company's present condition and plans for the future.

**FALCON LEAD MINING CO.****COLORADO**

Address: A. W. Grimley, Packer Bldg., Philadelphia, Pa. Mine address: R. L. Pellet, v. p.-gen. mgr., Rico, Colo.

Officers: Frederick Bradshaw, pres.; Robt. L. Pellet, 1st v. p.; Jas. C. Rogers, 2d v. p.; A. W. Grimley, sec.-treas.; M. Randell, asst. sec.-treas.; with J. P. Brock, M. B. Cutter, H. C. Gibson, C. A. Heller, S. D. Sinkler, Geo. P. Smith, C. B. Taylor, Wm. H. Smith and Erastus T. Tefft, directors.

History and capitalization: INC. May, 1924, by interests closely allied with Tonopah Belmont Dev. Co. to take bond and lease on part of property of Syndicate Mng. & Mlg., which see. CAP. \$3,000,000; \$1 par. Listed on New York Curb, Aug. 11, 1926. The price range of shares was high 90c in 1926; low 5c. in 1928. In 1929, high 64c.; low 10c.; last 12½c.

Property: 156 claims, 1,110 acres, with 20-acre mill site and 320 acres coal land, in the Pioneer district, Dolores county, includes the Yellow Jacket-Phoenix group, Nora, Lilley and Falcon mines. Ore occurs in fissure veins as lime replacements. Veins are reported to vary from a few inches to 15' in width, traceable for a mile and to be proven to a depth of 700'. In one mine the ores carry 4% copper, 10% lead, 10% zinc and 10 oz. silver, and occur as chalcopryite associated with pyrite, sphalerite and galena in fluoritic gangue.

Development: by tunnels, 1,000' to 3,000' long, cross-cuts, drifts and winzes.

Equipment: includes 125-h. p. hydro-electric plant at mine and 100-h. p. at mill, two 75-h. p. hoists, 2 compound air-compressors, 10 drills and mill, using two 9 by 15" Blake crushers, 18 Wilfley tables, flotation cells, etc.

Production: up to 1918 estimated at 1,200,000 lb. copper.

In 1926, company had a contract to ship 100 tons of ore daily to International Smelting Co. at Rico. Shipments were being made at this rate in late-1926 and part of 1927, when a general faulting system, interrupting the important orebodies, was encountered. Only desultory development work was done from then until late-1928 when an active campaign to discover the faulted extension of the orebodies was announced. The reported discovery of a body of high-grade gold-silver ore in February, 1929, is the last word received.

COLORADO

**PELLEYRE MINING & MILLING CO.**

COLORADO

Inc. in 1926, to acquire part of holdings of Syndicate Mng. & Mlg. Co. (q.v.), on Newman hill and Shamrock and Atlantic Cable mines on the W side of Dolores river, all in Pioneer district, Dolores county, at Rico. Ore carries lead, zinc, copper, silver and gold. Developed by shaft and tunnels.

**PENNSYLVANIA MINES CO.**

COLORADO

**Officers:** J. E. Johnston, pres.; James B. Clar, v. p.; W. E. Slaughen-  
houp, treas.; D. McAllister, sec., with B. H. Jones, James S. Seabee and  
J. P. Kerr, directors.

Capitalization: \$1,500,000; \$1 par; 1,000,000 shares issued. Registrar and transfer agent, Registrar & Transfer Co., New York.

Property: the Wanakah and Bright Diamond mines, 34 claims, 300 acres, in Uncompahgre district, Ouray county. Ore is pyritic and carries gold, silver and copper. Developed by tunnels with 10,000 of workings. Engineer's report stated that there were 160,000 tons of ore blocked out with average value of \$10 per ton.

Equipment: includes electric power, compressor and remodeled Wanakah mill, employing stamps, tube-mill, tables and 1 Ruth flotation unit. A 50-ton Mace smelter was installed in 1924.

• Comment: inactive 1926 and presumably since.

**PENNSYLVANIA MNG., PWR. & REDUCTION CO. COLORADO**

Address: Leopold Sternberger, mgr., 307 Edgehill road, East Milton,  
Mass. G. L. Levi v. p.-sec.

Inc. 1910 in Colorado. Cap. \$2,500,000; 600,000 shares in the treasury. Is a close corporation, owned by Leopold Sternberger and Estate of Samuel Sternberger. Owns entire stock issue of the Fall River Hydro Electric Power Co.; also the Lotus group of mines and property formerly held by Lucania Tunnels & Mines Co.

**Property:** lies between Fall River and Central City, Clear Creek and Gilpin counties, and includes the Pennsylvania group, 374 patented claims, including several mill sites and placers, covering about 2,500 acres. Shows fissure veins with complex lead-zinc-copper ore, containing silver and gold, also uranium, molybdenum and tungsten.

**Development:** by shafts and adits, about 8 miles in all; including the 6,400' Lucania tunnel.

**Equipment:** includes steam and hydroelectric plants, air compressors.

Several of the mines have been good producers in the past. Mine was operated in 1927 by E. C. Hartman, Central City. Property is for sale.

PENNSYLVANIA MOLYBDENUM MINES CO. COLORADO

Address: J. A. Sloan, sec., 220 Tioga Ave., Johnstown, Pa. Idle since 1919. Described in Vol. XVI.

PENROSE MINES, INC. COLORADO

Address: C. J. Walker, Boatman's Bank Bldg., St. Louis, Mo. Mine  
address: Jesse F. McDonald, Leadville, Colo.

COLORADO

Address: C. J. Walker, Boatman's Bank Bldg., St. Louis, Mo. Mine  
address: Jesse F. McDonald, Leadville, Colo.

Company operated and produced 1919 to latter part of 1922, when property was subleased to the Midnight Mng. Co., which see.

#### **RICHMOND MINE (WEST)**

**COLORADO**

Address: H. H. McDaniel, Salina, Colo., who operated this gold-silver mine in the Gold Hill district, Boulder county, in 1921-23. Was controlled by now defunct Interstate Metals Co. in 1919 and 50-ton flotation plant built, which has since been dismantled and moved. Mine idle because of lack of funds.

#### **RICO ARGENTINE MINING CO.**

**COLORADO**

Address: 539 Atlas Block, Salt Lake City, Utah. Mine address: H. L. Worcester, supt., Rico, Colo.

Officers: F. W. Price, pres.-gen. mgr.; J. E. Frick, v. p.; J. H. Woodman-sec, sec.-treas., with Geo. Baglin, J. E. McKnight, and A. E. Rykert, directors.

History and capitalization: INC. 1912, in Utah. In 1918, the Rico Cons. Mines Co. brought suit against this company and the Marmatite Mng. & Leas. Co. (defunct) over apex rights for wrongful extraction of 15,000 tons of ore, worth \$900,000. In 1921, judgment was rendered against the Rico Argentine and the Marmatite, but decision was reversed in 1923 by the Colorado Supreme Court and a new trial ordered, which never came up, and case has now been disposed of entirely. CAP. \$100,000; 10c. par; 750,000 shares outstanding; assessable; assessment of 1c. per share was pending in November 1924. Company is its own transfer agent and registrar. Listed on Salt Lake Exchange, price range in 1929 being 50c. in March to 15c. in December. DIVIDENDS: quarterly, 3c. per share, Dec. 15, 1927 to Dec. 15, 1928 inclusive.

Property: the Blackhawk and Argentine groups, 21 claims, 145 acres, mostly patented, in Pioneer district, Dolores county, adjoining the Rico-Wellington and Rico Cons. properties.

Geology: alternating strata of limestone and sandstone, dipping at angle of about 30° and cut by almost vertical fissures of great extent and persistence. Where these fissures cross the soluble limestone they contain flat replacement deposits of sulphide ores, carrying copper, zinc, and lead, with gold and silver values. The ore shoots or bedded deposits are from 3-30' thick; 15 limestone beds, believed to be ore-bearing, are known to exist above the Blaine tunnel level. These fissures and the limestone are identical both in character and occurrence with those which are producing in the Rico-Wellington property. In the apex suit with the Rico Consolidated, the Rico Argentine held that the Blackhawk fissure was the source of the enrichment of the beds that had been followed into the disputed ground; in other words, it was the master vein. Judge Searcy decided January, 1921, that the ore-beds were formed by EW fissures rather than by the Blackhawk. This reverses the generally accepted local theory.

Development: by 3 tunnels, Log Cabin, Argentine, Blaine. In 1918, it was reported that bismuth was appearing in some of the ore. A tunnel was driven 700' in the ground in dispute with the Rico Cons. and opened silver-lead-copper shipping ore.

Production: for 1917, \$100,000, the net smelter returns of which were \$88,837. Of this, \$47,576 was for ore shipped by company and \$41,261, shipped by lessees. On January 1, 1919, company operations were suspended until September, but lessees continued shipping at rate of 1,000 tons per month. Company resumed operations on Dec. 1, 1924, and shipments have been fairly regular since, during 1928-29 at rate of about 100 tons per day. Ore was sent to the smelter at Midvale, Utah, except in 1926-27 when it was treated in the flotation mill of Int. Smltg. Co., at Rico.

#### **RICO CONSOLIDATED MINES CO.**

**COLORADO**

Controlled by Knight Investment Co., 11 Knight Block, Provo, Utah. Mine address: Rico, Colo.

In 1918, company brought suit against the Rico Argentine Mng. Co. and the Marmatite Mng. & Leas. Co. (defunct) over apex right. See Rico Argentine for particulars.

Property: in Pioneer district, Dolores county, adjoining the Rico Argēh-

tine on the NE, shows a vein of copper-silver-lead ore 35' wide in the upper workings. For geology see the Rico Argentine.

Development: by tunnel over 300' long. Shipments have been made, but no figures are available.

Rico Mng. & Red. Co. had a bond and lease on this property in 1925, but has since relinquished it. Idle except for small amount of prospect work by a lessee.

#### **RICO ENTERPRISE MINING CO.**

**COLORADO**

Address: Robt. L. Pellett, pres.-mgr., Rico, Colo.

Inc. circa April 1927, in Colorado. Cap. \$100,000.

Property: about 100 claims on Newman hill and Dolores Mtn., in Dolores county at Rico. Ore carries gold, silver, lead, copper and zinc.

Developed: by several tunnels, including 1,800' Revenue and Pro Patria, drifts, raises and stopes.

Equipment: includes electric power, compressor and tramway.

Comment: in 1927, development only was done; in 1928, development was continued with shipment of 5,000 tons of ore averaging \$20 per ton; the shipment of 20 cars of ore in March 1929, was also reported. A rock slide on D. R. G. & S. Ry. in April, 1929, which was not cleared by end of year, required shipment by roundabout route to Utah mills and smelter. The added freight rate made shipment of lower-grade ore prohibitive. Steps to clear up the traffic problem were in progress in late-1929.

#### **RICO MINING & REDUCTION CO., THE**

**COLORADO**

Described in Vol. XVII. Company acquired the property of now defunct Rico-Wellington Mng. Co. in early-1929 and soon after was itself taken over by St. Louis Smelting & Refining Co., which see.

#### **RITO SECO GOLD MINE**

**COLORADO**

Mail returned from 811 Merchants National Bank Bldg., Los Angeles, Calif. Fifty-one per cent of stock formerly owned by now defunct Mohave Gold Mining Co. of California.

Property: about 800 acres, patented, near San Luis, in Costilla county.

Development: shafts, tunnels, crosscuts and drifts, claimed to have proved 5,900,000 tons of ore which were to be mined by steam shovel and treated in a flotation plant, to have a capacity of 1,250 tons daily.

Idle since 1921-22, owing to high costs. Presumably dead.

#### **RIVER SMELTING & REFINING CO.**

**COLORADO**

Affiliated with National Lead Co., 722 Chestnut St., St. Louis, Mo.

Works address: H. H. Utley, mgr. and ore purchaser, Florence, Colo.

Organized about 1913 jointly by National Lead and Stone & Webster, of Boston. Operated a custom zinc smelter at Florence, Fremont county, for treatment of complex Colorado ores, until late-1927 when, according to report, operations were discontinued. Fully described in Vol. XVII.

#### **RIVER VIEW LEASING CO.**

**COLORADO**

Mail returned from Creede, Mineral Co., Colo.

Property: River View silver mine at Creede, operated in 1920; but no information since.

#### **ROANOKE MINING & MILLING CO.**

**COLORADO**

Mail returned from 221 Foster Bldg., Denver, Colo.

Officers: E. LeN. Foster, pres.-treas.; F. G. Warden, v. p.; W. C. Johnston, sec.

Inc. in Colorado. Cap. \$100,000; 10c. par; all outstanding.

Property: 11 patented claims, includes the Cleveland Tunnel, at Grant, Clear Creek county, showing gold, silver, bismuth, and lead ore in a fissure vein in granite, reopened after 20 years. Ore is a sulphide almost 2' wide, and runs N. 60° E.; said to assay 10 to 2,000 oz. silver, 30% lead, and 0.2 oz. gold per ton.

Development: by tunnel 1,500' long, and total of 3,600' of workings.

Company was active 1919-20 but idle in 1921. In 1922, the Cleveland tunnel cut the Treasure Vault vein and it was being developed in 1923; no information since.

#### **ROBERT E. LEE LEASING CO.**

**COLORADO**

Presumably out of business; see what is said under Robert E. Lee Mine.



**Comment:** the objective announced by the company president in 1926 "to bring under one operation practically the entire Breckenridge district" has been brought much nearer attainment by the recent large acquisitions.

**RUBY CONSOLIDATED DEVELOPMENT CO. COLORADO**

**Address:** C. F. Winter, Melrose Highlands, Mass. **Mine address:** Irwin, Colo.

**Officers:** Albert Sutcliffe, pres.; W. G. Fisher and C. A. Lapworth, v. p.; C. F. Winters, sec.-treas.

**History:** incorporated April 9, 1919, in Maine.

**Capitalization and dividend record:** CAP. \$1,000,000; 50c. par; which includes \$500,000 com. and \$500,000 12% cum. pfd; \$309,812 com. and \$12,113.50 pfd. outstanding. On Oct. 16, 1924, Company voted to retire the common stock and issue pfd. in its place, without disturbing the original capitalization of \$1,000,000. **DIVIDEND:** 2% was paid on pfd. on March 1, 1925, and initial of 2% on com. was paid Dec. 15, 1923; none since. Transfer agt., Liberty Trust Co., Boston. Annual meeting, 2nd Wed. in January.

**Property:** 10 claims (2 patented), includes the Ruby Cons. No. 7, in Elk Mtn. district, Gunnison county, at Irwin, near Crested Butte, ore carrying silver, with some gold. **Equipment:** includes steam power and Ingersoll-Rand compressor.

**Comment:** company is primarily interested in oil. The mining properties have been idle since 1920, although it was reported operations were to be resumed in 1929.

**RUUTTILLA-BROWN LEASING CO. COLORADO**

**Address:** Ophir, Colo. Operated the Carbonero mine in San Miguel county, in 1920-23, now being operated by Ophir Carbonero Mines Co., which sec.

**RYAN MINING CO. COLORADO**

**Address:** Vincent M. Ryan, Box 86, Idaho Springs, Colo.

**Officers:** H. J. Wagner, pres.; Geo. L. Bauer, v. p.; Vincent M. Ryan, sec.-treas.

**Inc.** Jan. 26, 1926, in Colorado. **Cap.** \$100,000; \$1 par; non-assessable; 50,000 shares outstanding.

**Property:** 6 patented claims, 100 acres, including Ivanhoe, Ben Harrison and Ryan mines in Gilpin and Clear Creek counties, near Idaho Springs. Ore carries gold, silver, copper, lead and zinc in fissure veins in porphyry and gneiss. Developed by 3 tunnels to a depth of 1,300'. Examined by Charles Glasgow and Charles Jordan.

In mid-1929, company was attempting to finance the building of a mill by sale of stock.

**SACRAMENTO GOLD MINING & MILLING CO. COLORADO**

**Address:** Box 178, Colorado Springs, Colo. **Mine address:** D. C. Wana-maker, Cripple Creek, Colo.

**Officers:** D. P. Strickler, pres.; Wm. Lennox, v. p.; Wm. Lloyd, sec.-treas., with J. H. Weimer and Tyson S. Dines, directors.

**History and capitalization:** INC. 1921 in Wyoming, as a reorganization of the Sacramento Gold M. & M. Co. CAP. \$10,000; 1c. par; all issued; controlling interest being held by W. S. Stratton Estate, which pays all carrying charges except taxes. Old company shares were exchangeable for new stock, share for share. On Dec. 1, 1925, company had \$965 cash balance.

**Property:** the Sacramento, Midnight and Last Chance claims, 9 patented acres, at Cripple Creek, Teller county, intermittently under lease during past 20 odd years, company itself never having operated. Property is considered to be fairly well located and has not been fully developed.

**SAGUACHE EAGLE MINING CO. COLORADO**

In 1925 property at Villagrove, Colo. was taken over by the Clary Mng. Co. of Iowa, which see.

**ST. ELMO MINING CO. COLORADO**

**Address:** Montezuma, Colo. **Property:** the Liberty Bell and Mark Twain mines at Montezuma, Summit County. Ore carries gold, silver and lead. Operating 1920-22; presumably idle since.

**ST. JOHN MINES (COLORADO), LTD. COLORADO**

**Address:** Williamson & Nicholas, Ltd., sec., 38 Broad St. House, London, E. C. 2, Eng. **Directors:** Geo. A. Williamson, chairman; J. O. Shepherd and M. M. Dewar.

**Inc.** Feb. 13, 1913. **Cap.** £75,000; 5s. par; all issued and fully paid.

During 1917 the company's property was sold to the Montezuma Silver-Lead Mines, Ltd., for £55,000 in stock, out of which the mortgage debt was discharged. This is now only a holding company, of which the chief asset is 40,000 ordinary shares of the Montezuma S.-L. Mines, Ltd. Fully described in Vol. XIV.

**ST. JOHN MINING CORP. COLORADO**

**Address:** T. B. Burbridge, American Natl. Bank Bldg., Denver, Colo. **Mine address:** Walter Head, supt., Montezuma, Colo.

Company operated the mine and mill of the Montezuma Silver-Lead Mines, Ltd., (q.v.) in 1926 and 1927. Presumably dead.

**ST. LOUIS INDEPENDENT SMELTING & REFINING CO. COLO.**

**Address:** O. E. Buder, sec., 500 Buder Bldg., St. Louis, Mo. **Mine address:** Ouray, Colo.

**Officers:** G. A. Franz, pres., Los Angeles, Calif. O. E. Buder, sec.-treas.

In early-1926, this company took over Z. A. D. B. Mng. Co.'s lease on the Bachelor-Khediye mine of the Bachelor Cons. Co. (q. v.) and some claims to the east of Bachelor property. In December, 1926, after spending over \$100,000 for development work, mining machinery and mill building and equipment, the company discontinued operations. The company apparently operated part of the year 1928 and 1929, with a small force.

**ST. LOUIS SMELTING & REFINING CO. COLORADO**

Subsidiary of National Lead Co.

**Address:** Edw. J. Cornish, pres., International Life Bldg., St. Louis, Mo. **Mine address:** D. M. Kleine, supt., Rico, Colo.

**Property:** (a) the Cocomongo-Bonanza groups formerly operated by the Cocomongo Mines Co. (q. v.), and now defunct Kerber Creek Mng. Co., at Villagrove, Bonanza (Kerber Creek), district, Saguache county, shows ore carrying silver, lead and copper, with some gold. Developed by shafts, and a winze sunk on the 400' level. Equipment includes 450 cu. ft. compressor and 50-ton table and flotation concentrator.

(b) also acquired in early-1927, the entire property of the now defunct Rico Mng. & Red. Co. including the Silver Swan, Wellington, Mountain Spring and Pigeon mines, in Dolores county, at Rico. Ore contains lead, zinc and silver and occurs in flat dipping fissure veins in contact deposits along bedding planes in sedimentaries. Developed by shafts and tunnels, 200' to 2,000' long, to a depth of 800', with several miles of workings. Equipment includes electric power, compressors and pumps.

The Bonanza properties produced through 1927, but not known whether more than development work has been done since. The Rico properties have been active and producing since their acquisition. A rock slide in early-1929 on the D. & R. G. Ry., and not opened during 1929, cut off the direct route to Utah mills and smelter and curtailed production to ore of sufficiently high-grade to stand the extra freight on shipments via Durango.

The company operated the Hidden Treasure mine at Lake City, Hinsdale county part of 1926. It also operates in Illinois and Oklahoma, which see for further details.

**ST. PAUL MINING & REDUCTION CO. COLORADO**

**Address:** Frank L. Ross, sec., Gas & Electric Bldg., Denver, Colo. **Norwood Johnson**, pres.-treas.; J. B. Ross, v. p.-gen. mgr.

**Inc.** March, 1908 in Colorado. **Cap.** \$100,000; \$1 par.

**Property:** St. Paul group, in Eureka district, San Juan county, near Red Mountain.

**Development:** by 300' shaft, with levels at 200' and 300', developing small but rich ore shoots, said by former management to carry 8% copper,

# MINING YEAR BOOK



1947  
THERE'S METAL IN YOUR FUTURE

**PRODUCE MORE**

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FIFTY years ago, Rico and other mining districts of Dolores County were struggling through the depression period following the demonetization of silver in 1893. Silver prices had dropped from a high of about \$1.19 in August of 1890, and were quoted at 56c in August of 1897. During the same period, lead also declined from about 4.72c to 3.60c.

With reduced crews at the mines, much of the unattached population headed for the Klondyke, and the promised bonanzas in the Alaska and Yukon territory.

Producing mines near Rico during 1897 included the Iron Mine, Enterprise, Rico Aspen, Logan, Wellington, Black Hawk, Princeton, Swansea, Emma (Dunton), Argonaut, and eighteen smaller pro-



Rico, Colorado about 1900.

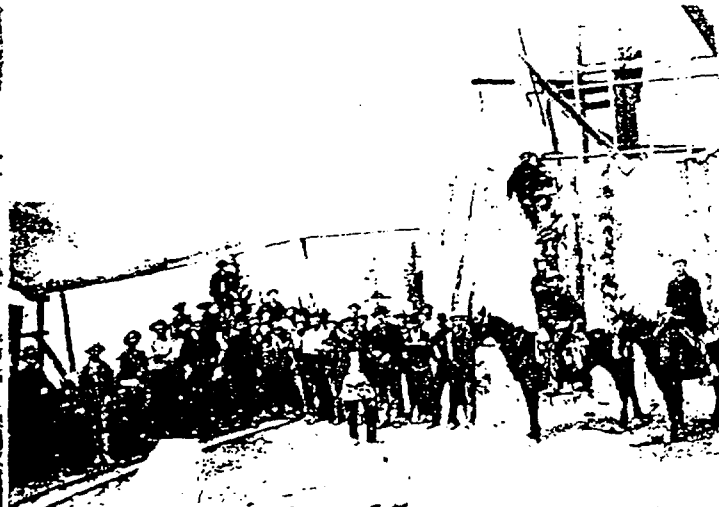
ducers. Total production for 1896 was about 8,500 tons, mostly shipped via Rio Grande Southern Railroad, narrow gauge line through the San Juan country, to the Durango smelter. The last of the Rico smelters had been shut down two years previously.

In an effort to encourage mining investment in the San Juan region the Rico Board of Trade on March 11, 1896, played host to 65 delegates from San Miguel, Dolores, Montezuma, La Plata, Archuleta, San Juan and Hinsdale counties, and the general officers of the Denver and Rio Grande railroad; at this meeting the San Juan mining Bureau was formed. President of the Rico Board of Trade at this time was Joseph Meredith, prominent mine operator and owner; he later became a director in the Colorado Metal Mining Association.

While, elsewhere, William Jennings Bryan was demanding free coinage of silver at a Jackson Day dinner, Rico miners were selectively mining high-gold ores in the Newman Hill veins, and some efforts were made to work the Dolores River placers. The Emma Mine, in Dunton, whose ores are principally gold, was operated successfully, though the veins were narrow.

In this year also, the celebrated Enterprise-Rico Aspen dispute over the Vestal ground was settled by the United States Supreme Court in favor of the Enterprise Company. However, the ore in the ground under dispute had been largely mined out during the litigation by the Rico Aspen Company. President of Rico Aspen at this time was David H. Moffat, the Denver Banker. In this case, it was held that the Jumbo No. 2 vein, first discovered in the Group tunnel, driven by the Enterprise Company, was Enterprise property where it passed into the patented ground of the Vestal claim, which was owned by the Rico Aspen Company. This decision culminated five years of disagreement, featuring raids by the rival companies into the disputed ground, blasting down haulageways and airways, and burning of sulphur in the airways to drive out the opposition, as the two mines were connected in the Vestal ground.

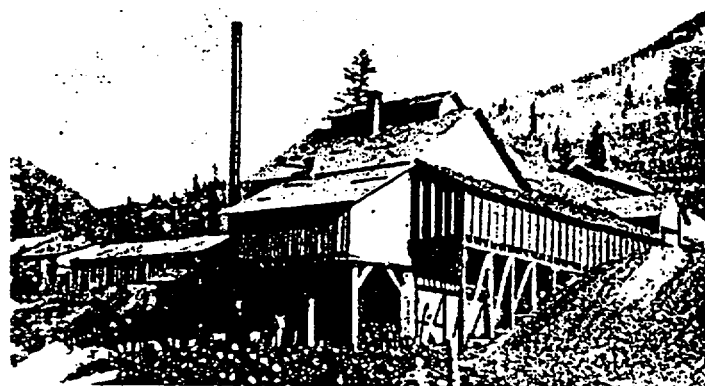
Miners of 1887—Enterprise shaft—Rico, another view.





Scenes of a West That's Gone

Many changes have occurred in America's West since these pictures were taken. A half century ago the photograph, which is the property of Alfred E. Kelly of Fort Collins, O., shows two scenes in Rico, a town in the old and silver mining region of Colorado. In the picture ABOVE two men are riding horses down a steep, rocky hillside. The picture BELOW shows a horse-drawn wagon on a dirt road in front of a wooden building. The picture was taken in July 1896.



Reading from top to bottom: Scene in Rico 1896. Rico Float at Spanish Trails Fiesta (John Sharer). Grand View Smelter (Rico) 1886. Lizard Head Peak and Mt. Wilson.

By 1900, most of the extremely high grade silver ore had been extracted from known deposits of the district, and the only shipments being made were occasional carload lots from small leasing operations. In this year, B. N. Griffin, a Connecticut button manufacturer, built the Pro Patria aerial tram, and the Pro Patria mill, in the Rico townsite, to handle ores from the Jumbo 3 vein. Dr. Henry F. Campbell of Boston organized the Rico Mining and Milling Company about this time and in 1901 shipped approximately 1,000 tons of zinc concentrates magnetically concentrated from Atlantic Cable zinc ores to the Vielle Montagne Zinc Works, in Antwerp, Belgium. In 1902, nearly all the mines in the district except those on C. H. C. hill were consolidated in the United Rico Mines company, under the leadership of David H. Moffat, chairman of the Board, Samuel Newhouse, Vice President, and A. B. Roeder, President and General Manager. Some work was done on the Atlantic Cable mine, and some experimental concentration carried out on the Atlantic Cable zinc ores, but the operation was more promotional than operational, and little production resulted from the consolidation. Mr. Roeder conducted the affairs of the company in a grand manner; he had a private train when he traveled to New York, and the company sponsored many civic enterprises, such as the 24-piece United Rico Band, which serenaded Mr. Roeder as his train would return from New York with a group of the company's stockholders. It is regretted that underground operations were not prosecuted with equal vigor.

In 1906, after several years of spasmodic activity, United Rico Mines began to give leases on property owned by the company, and Lessee J. D. Adams, a Rico merchant, began shipping about 400 tons per month of oxidized lead-zinc ore from the Blackhawk. The Pro Patria mill operated on this ore during the latter part of the year. During 1907, the Blackhawk lease was continued, the Pro Patria Mill was remodeled and running on Pro Patria and Ute vein Newman Hill ores, and construction was started on the Group Mill. David Swickheimer, the ex-millionaire of Newman Hill, was doing development work on the Wellington and Mountain Springs properties on C. H. C. hill, and in the Puzzle mine in Horse Gulch. J. D. Adams, Blackhawk lease-holder, unwatered the Argentine shaft, sunk fifteen years previously by Peter Fassbinder, and opened up the middle Hermosa limestone replacement deposits in an area which is still being developed and exploited. A. E. Arms, a surveyor, and F. A. W. Day made some production from the Silver Swan property on Expectation mountain, and J. W. Burns developed considerable medium grade ore in the Rio Dolores property two and one half miles above town but no shipments were made from the Rio Dolores at this time. The panic late in the same year shut down everything in camp, excepting a few individual leases. During this 1906-07 period the Emma, Almont, Americus, Smuggler and Rosebud were working gold-quartz deposits in the Dunton district; a 20 stamp mill was operated on the Smuggler Almont ores by the Mt. Gorum Mining and Milling Company, a Milwaukee Concern.

In 1911 United Rico went into receivership, and was reorganized to form the Rico Mining Company. In 1915 the Rico Mining Company went into receivership again, and came out the Syndicate Mining and Milling Company. The Rico Argentine Mining Company first entered the camp in 1912, when a lease and option was obtained by this company from the Rico Mining Company, on the old Blackhawk property. The Rico Argentine Mining Company was headed by Fred Price, of Salt Lake City. The Rico Wellington Company, with mines on C. H. C. Hill, leased the Pro Patria mill in 1912 and employed General Engineering Company of Salt Lake City to remodel it, replacing Huntington mills with rolls, and installing jigs and tables. About 75 to 100 tons of Wellington lead-zinc ore per day were milled for the first six months of the year. The Rico Argentine leased the mill for the latter half of the year, milling about the same daily tonnage. These two operations shipped a substantial tonnage of ore up to 1919, when the bulk of the district's production for this year was mined by the Marmatite Mining and Milling Company, a small leasing operation shipping about 400 tons a month from the Blackhawk and other mines.

In the summer of 1914 considerable excitement was aroused when Shellhamer Brothers and Dick Batchelor, leasing on the Pro Patria, discovered a small streak of very high grade gold ore. The

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"picture rock" did not continue, however, and a small production ended the "big Strike."

During the first World War period the Calico Peak Alunite deposits at the head of Horse Gulch created considerable interest for the alumina and potash content. A million dollar offer for the locations was refused at that time. The Horse Gulch area also experienced quite a prospecting campaign under the direction of Prof. John W. Prout, who was determined to solve the puzzle. However, after a shaft was sunk, and numerous drifts and crosscuts driven in the hope of picking up the lost Puzzle vein of high grade silver ore, the campaign which was started in 1915 was finally abandoned, without success in 1918.

The largest shippers from the district in 1920 and 1921 were the Rico Wellington group, operating the General Sheridan, Iron Rod and other claims. This Company continued to be the district's largest producer through 1922 and 1923, followed by the Falcon and Yellow Jacket mines on Nigger Baby hill, which shipped about 1,000 tons of lead-copper silver ore in 1923. The Falcon and Nigger Baby groups were obtained in 1923 under lease and option for \$100,000 by R. L. Pellet of Rico, from the Syndicate Company.

Gross value of production diminished from \$64,311 in 1923 to \$24,220 in 1924. Producing mines during 1924 were the Emma mine at Dunton, and the C. V. G., Nora Lilly, Falcon, and Yellow Jacket in the Rico District. A total of 562 tons was shipped during the year. During 1924 R. L. Pellet took a lease and option for \$75,000 on the Newman Hill and Shamrock groups, including the Pro Patria Mill and the Atlantic Cable mine, from the Syndicate Mining and Milling Company. These properties were turned over to the Pelleyre Mining and Milling Company, a subsidiary of International Smelting Company of Salt Lake City. The Yellow Jacket, Falcon and other mines on Nigger Baby Hill were grouped into the Falcon Lead Mining Company. Prominent stockholders were R. L. Pellet, E. T. Tefft, and others.

Production for 1925 increased to \$353,563, due to the entrance into the district of four strong companies, namely: Pelleyre Mining Company (International Smelting), Rico Argentine Mining Company, Falcon Lead Mining Company, and the Rico Mining and Reduction Company. The Rico Mining and Reduction Company obtained the Silver Swan mine from Day Bros. and A. E. Arms, the Argentine Shaft, and the Rico Wellington property from the Knight Investment Company of Salt Lake City. Stanley Walker was General Manager of the Rico Mining and Reduction Company. Operating mines during 1925 included the Emma (Dunton), C. V. G., Buckhorn, Atlantic Cable, Shamrock, Yellow Jacket and Falcon Group, Rico Argentine, and Union Carbonate. A small tonnage of lead smelting ore was shipped to the Durango smelter (A. S. & R.), and lead-zinc ores were shipped to selective flotation mills at Midvale (U. S. S. & R. Co.) and Tooele, Utah. A substantial reduction in freight rates from Rico to Salt Lake City was brought about at this time by the International Smelting Company. This was a contributory factor to the increased production of the district this year.

Further increases in production were registered during 1926, to bring the total gross value of ore shipped during that year to \$990,281. Lead-silver carbonates were produced from the Union Carbonate, operated by George E. Collins, and the Lillia D., operated by the Rico Mining and Reduction Company. Lead-zinc ores were being produced by the Yellow Jacket property; the Rico Mining and Reduction Company's Argentine shaft, Silver Swan, Lillia D., Lucky Boy and Rico Wellington mines; Pelleyre Mining Company's Shamrock; and the Rico Argentine Mine. The Rico Argentine Mining Company produced 5170 tons, gross value \$118,393. This company had been idle from 1920 to 1926 due to apex litigation with the Rico Consolidated property, owned by the Jesse Knight Investment Company of Salt Lake City, but a settlement was reached and production resumed in 1926. Shipments were made to the International Smelting Company flotation plants at Tooele, Utah, and to the Combined Metals Reduction plant at Bauer, Utah. The old Pro Patria mill in Rico was remodeled and converted to a 225 ton custom flotation mill in October of this year by the International Smelting Company, and ores from most of the major producers of the camp were treated.

The International mill operated intermittently for about two years. Largest producer for the mill was the Rico Argentine Mining Company, followed by the Falcon Lead Mining Company, the Rico Mining and Reduction Company—and its successor, the St. Louis Smelting and Refining Company—Pelleyre Mining and Milling Company, and the Rico Enterprise Mining Company. The Rico Argentine Mining Company derived its ore from the Black Hawk group, through the Log Cabin and Argentine adits. This company declared a dividend of \$24,000 in 1927. Falcon lead produced their ore from the Yellow Jacket, Nora Lilly and Falcon, on Nigger Baby Hill. Rico Mining and Reduction Company operated the Lillia D., Silver Swan, Maggie group, Iron Group, and Argentine shaft group until May, 1927, when all its holdings were transferred to the St. Louis Smelting and Refining Company (a subsidiary of National Lead). At the time of this purchase the Baer Brothers and others, of Rico, were driving a prospect heading in the Mountain Springs mine on a lease. Upon pressure being brought to bear, they sold their lease to the St. Louis Smelting and Refining Company for \$16,000. The heading was continued under the new owners, and struck a fine ore body but a few feet from where the leasers left off. This body of ore was said to have produced about \$300,000. Pelleyre ore came from the Shamrock property. Rico Enterprise derived their ore from the Jumbo 3 and Eureka veins. The former Rico Wellington property was operated by the Rico Mining and Reduction Company, and later by the St. Louis Smelting and Refining Company. About 1600 feet of development was done in 1927 in the old Union Carbonate mine, and some production of oxidized lead ore made during the year. Some development was done on the Buckhorn property and the Badger and Hidden Treasure adits; and the Rico Ventura Mining Company performed 465 feet of development work on the A. B. G. and C. V. G. groups (formerly the Rio Dolores property). Some maintenance and development was performed during 1927 at the Emma and Smuggler-Almont mines in Dunton, but no production ensued.

Total gross mine production of Dolores County for 1927 (All from Rico) was \$1,432,554.

Production held up well through 1929, in which year the camp's total production was about 32,000 tons, of which the Rico Argentine mined about half, and the St. Louis Smelting and Refining Company, Rico Enterprise Mining Company, Union Carbonate, and Falcon Lead produced the remainder.

From 1929 to 1930, depressed metal prices caused the cessation of most active company-account operations in the district, except the Rico Enterprise which continued operation on the Pro Patria for several years on the high-silver fissures, which with small leases by local residents, kept them going. In October, 1930, the St. Louis Smelting and Refining Company started the St. Louis Tunnel into the base of C. H. C. Hill, to prospect the formations below the Mountain Springs level, and to provide a haulageway for the Mountain Springs, above. This tunnel was driven into the hill for about 5150 feet. Unfortunately, ore developed by this ambitious undertaking was not up to expectations, and after a few more years, this company suspended all operations in the district, relinquishing all their Rico interests in 1943. The International Smelting Company retained their interests in the district, chiefly the Newman Hill, Atlantic Cable and Shamrock mines, until 1941, when they gave up their options.

Control of the Rico Argentine Mining Company, operating the Blackhawk and other early producers, was obtained in 1937 by Mr. J. A. Hogle of Salt Lake City. The adjoining Rico Consolidated property was purchased and the Argentine shaft properties were also opened on a lease basis. The financial structure was revamped, a development campaign was commenced this year and a 135 ton selective flotation lead-zinc mill built in 1938, near the mine, all under the direction of C. T. Van Winkle, general manager. A few months after completion of the mill, production of 3000 tons per month of lead-zinc ore was begun, and has continued without interruption up to the present day. The ore bodies of the Rico mines are small to medium sized, and a persistent program of exploration and development has been necessary to develop new ore bodies as the

old ones are worked out. Development of the Rico Argentine group of properties has continued, and in 1942 the Pelleyre properties in the Rico Townsite area and Newman Hill were acquired; the Pro Patria and Revenue Tunnels in this group were reopened, with consequent small production up to the present time. The Van Winkle shaft was sunk 300 feet to the Devonian limestone beneath the Rico townsite, in 1942, to develop lead-zinc replacement ore bodies known to exist in this formation in the Atlantic Cable, Shamrock, and other mines. At the present time, over half of the Rico Argentine Mining Company's production is hoisted through this shaft. In 1943 the St. Louis Smelting and Refining Company withdrew from the district, and their properties were acquired by the Rico Argentine Mining Company. The St. Louis Tunnel and Mountain Springs mine, of this property, are now being re-opened, and some development has been begun to put the property back into production. In addition, the Rico Argentine Company has taken a lease and option on the Falcon group of properties on Nigger Baby Hill, and the Larsen Tunnel is being driven into the base of the hill to develop ore-bearing horizons of this group at depth.

At the present time one company, the Rico Argentine Mining Company, under the management of C. T. Van Winkle, President and General Manager, is the only producer of the camp. Annual production for the years 1939 to 1946 follows:

Year	Tons Crude Ore Milled		AVERAGE ASSAY				
	Copper	Lead-Zinc	Oz. Gold	Oz. Silver	% Lead	% Zinc	% Copper
1939		10,673	.012	3.83	8.46	11.23	1.06
1940	7,895		.02	7.02	1.00	1.45	4.97
		23,824	.015	4.25	7.45	10.29	.84
1941		35,720	.001	3.60	8.3	10.4	.25
1942		34,735	.001	3.66	7.85	10.47	.18
1943		33,765	tr.	5.81	10.23	15.94	.26
1944		36,558	tr.	5.16	9.86	17.2	.28
1945		35,796	tr.	4.885	7.779	14.77	.18
1946		35,711	tr.	4.97	6.89	13.67	.20
	7,895	246,782					

It may be noted that since the beginning of the war many Navajo Indians have been employed in the mines in various capacities and during critical manpower shortage, have done much to relieve the situation.

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# MINERAL RESOURCES

OF THE

# UNITED STATES

## 1927

FRANK J. KATZ

Chief Engineer, Division of Mineral Statistics

### PART I—METALS



UNITED STATES  
GOVERNMENT PRINTING OFFICE  
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milled at the Wasatch-Colorado jig and table mill, yielding a few tons of lead-silver concentrate and a few tons of zinc concentrate (not sold). A car of lead ore carrying also zinc, was mined from the Dunkirk-Payrock group and milled at the Rose City No. 2 mill, yielding a lead-silver concentrate. Several hundred tons of lead-zinc-silver ore from the Clara B mine was milled at the Georgetown Tunnel Transportation Co.'s flotation-gravity concentration mill, yielding a lead-zinc concentrate, the zinc of which was lost in smelting. The Wasatch-Colorado jig and table concentrating mill was operated for a short period, but the lead and the zinc concentrates produced were not marketed in 1927, awaiting a higher metal market. Other small producers were the Buster, Capital, Cyclone, Daniel Peters, East Griffith, and Mammoth. At the Mineral Chief property (opened by a 2,000-foot adit) 200 feet of drifting, 250 feet of crosscutting, and 55 feet of winzing were done. The St. George 60-ton flotation mill was idle, but development work was done at the mine.

*Idaho Springs district.*—Twenty-one mines in the Idaho Springs district produced 4,104 tons of ore, yielding \$48,264 in gold, 11,956 ounces of silver, 16,381 pounds of copper, and 68,190 pounds of lead, with a total gross calculated value of \$61,485 as compared with \$86,897 in 1926. The largest producing property was the West Gold, from which gold telluride and free gold ore were shipped to the Golden Cycle mill at Colorado Springs. The next largest producing property was the Specie Payment, from which gold smelting ore was sold to the Idaho Springs sampler and gold milling ore was treated at the Newton gravity concentration-flotation mill at Idaho Springs. Gold ore from the Treasure Vault mine was sold to the Golden Cycle mill; small test lots went to the Combination mill and to the Elliott-Barber mill, both at Idaho Springs. Some gold ore from the Elliott-Barber mine was sold to the Golden Cycle mill and some was treated at the company's own concentration mill. The North American Mining Co.'s Central (or Big Five) 9,454-foot crosscut adit was placed in operating condition by removing the fallen rock, retimbering where necessary, relaying new rails, and repairing ore cars, power house, and motors so that custom tramming could be done and air furnished for ventilation and for power for drills and hoists at the Lake mine. In addition, lessees operated the North American's own veins—the Edgar, the Bald Eagle, and the Fulton. The lessees' ore consisted of dry gold and silver ore, which was sent to the Newton mill, and of dry gold and silver and lead-silver-gold-copper smelting ore. Lead-copper-silver-gold and dry gold and silver concentrates were produced. No production was made from the Lake mine, but 1,200 feet of drifts, 200 feet of crosscuts, and 190 feet of raises were driven between January 12 and September 30, 1927. Other producers were the Almaden, Lincoln, Little Mattie, Lord Byron, May Day, Maud Monroe, and P. T.

*Montana district (Lawson, Dumont).*—Five mines in the Montana district produced 340 tons of ore, yielding \$115 in gold, 5,349 ounces of silver, and 26,698 pounds of lead, with a total gross calculated value of \$4,830 as compared with \$39,586 in 1926. Producing mines were the Bellevue-Hudson, De Caprivi, Jo Reynolds, Millington, and Senator.

*Trail Creek district (Lamartine, Freeland).*—The Trail Creek district produced 376 tons of ore, yielding \$2,395 in gold, 1,125 ounces of

silver, 313 pounds of copper, and 52,238 pounds of lead, with a total gross calculated value of \$6,365 as compared with \$14,253 in 1926. Lead-gold-silver smelting ore was shipped from the Brighton, Crazy Girl, Neglected, and New Era; gold ore was shipped from the Donaldson-Wheatland and Puckett to the Golden Cycle mill. At the New Era mine retimbering, cleaning out cave-ins, and relaying track and air lines was begun in February, 1927. The mill was repaired and was operated during June and to July 15 on a test run. The ore is crushed to  $\frac{1}{4}$  inch; it then goes to rolls and to jigs; tailings from jigs go to regrind and to tables. The concentrates produced were lead-gold-silver. Development work at the New Era totaled 225 feet of drifts; at the Crazy Girl, 200 feet of shaft sinking and 3,000 feet of drifts; and at the Neglected, 100 feet of drifts. The Freeland mine and mill were idle.

#### CONEJOS COUNTY

*Platoro district (Ute, Decatur).*—Assessment work was continued in the Platoro district, a producer from 1882 to 1906.

#### CUSTER COUNTY

*Hardscrabble district (Westcliffe, Silver Cliff).*—Several small lots of highly siliceous silver ore were shipped in 1927 from Westcliffe, from the Black Friday, Maxine Elliott, and S. A. K. groups. The new shaft on the Passiflora mine was continued to 280 feet and drifts run, but no ore was shipped.

*Oak Creek district (Ilse).*—At the Terrible mine at Ilse, 23 miles from Florence, development work amounted to 2,587 feet in 1927. The ore, a low-grade lead ore containing cerussite without gold, silver, or other metals, was concentrated as theretofore by Wilfley tables and Harz jigs. The high-grade lead concentrate produced was as usual sent to the Eagle-Picher Lead Co., at Joplin, Mo.

#### DOLORES COUNTY

The total gross calculated value of the mine production of metals in Dolores County in 1927 (all from Rico) was \$1,432,554 as compared with \$990,281 in 1926, \$353,563 in 1925, and \$24,220 in 1924.

With the exception of lead-silver smelting ore from the Pigeon, Shamrock, and Union Carbonate mines, all the ore mined was complex lead-zinc-copper-silver-gold-iron sulphide milling ore, which was treated at the International custom selective flotation plant at Rico. This 225-ton plant began operations October 1, 1926, and operated for nine months in 1927.

The milling ore came from various properties under various ownerships and various options and leases. The largest production was from the Rico-Argentine, followed by the Falcon Lead Mining Co., the combined output of the Rico Mining & Reduction Co. and its successor, the St. Louis Smelting & Refining Co., the Pelleyre Mining & Milling Co. (subsidiary of the International Smelting Co.), and the Rico Enterprise Mining Co.

The Rico Argentine Mining Co. mined its ore from the Black Hawk group, through the Log Cabin, Argentine, and Blaine adits. This company declared a dividend of \$24,000, or \$0.03 per share, on January 1, 1928. The property was in litigation for six years prior

1925, but a settlement was reached in December, 1924, and mining operations began in January, 1925. Shipments of lead-zinc ore to Utah began in August, 1925. The Falcon Lead Mining Co. mined its ore from the Nigger Baby Hill (or Yellow Jacket) group, upon which 878 feet of raises, 1,788 feet of drifts, and 1,287 feet of crosscuts were driven in 1927. The Rico Mining & Reduction Co. operated the Lillie D., Silver Swan, Maggio group, Iron group, and Argentine group until May 1, 1927, when all its holdings, assets, and liabilities were transferred to the St. Louis Smelting & Refining Co. The Pelleyre Mining & Milling Co. mined its ore from the Shamrock claim. The Rico Enterprise Mining Co. mined its ore from the Pro Patria claim, upon which 190 feet of raises, 319 feet of drifts, and 425 feet of crosscuts were driven in 1927. The former Rico Wellington Mining Co. was operated by the Rico Mining & Reduction Co. and later by the St. Louis Smelting & Refining Co. The Union Carbonate mine is opened by various adits; the old vertical shaft has caved; about 1,600 feet of drifts, raises, inclines, and crosscuts were driven in 1927; the ore is oxidized, and the minerals are cerussite, anglesite, galena, limonite, and a little minium, plumbogjarosite, and smithsonite; sorting by hand and close selective mining were used. At the Badger group drifting and crosscutting amounting to about 150 feet were done under lease and option until the termination of such on March 31, 1927; the group is opened by the 700-foot Badger adit and by the 510-foot Hidden Treasure adit to the old Sunflower shaft, from which several hundred feet of drifting had previously been done. No ore was produced from the A. B. G. and C. V. G. groups, upon which the Rico Ventura Mining Co. drove 325 feet of drifts, 40 feet of raises, and a 100-foot shaft. The Buckhorn group is opened by an adit 1,500 feet long with several hundred feet of laterals; parts of the tunnel were retimbered and 200 feet of new drifting was done; this property was once opened by the Sawyer shaft, said to be 236 feet deep, now caved and inaccessible.

The International Smelting Co.'s Rico mill, installed in 1926 in the old Pro Patria mill building (with additions), began operations in October, 1926. Ore is brought to the mill by team and truck. Crushing is done by an 18 by 24 inch Blake crusher, by 42 by 16 inch Traylor rolls, and by an 8-foot by 36-inch ball mill. Other equipment includes one 10-foot Dorr drag classifier, two Minerals Separation (14 cells each) flotation machines, one American 6-leaf filter, and two 25 by 9 by 11 redwood thickening tanks. The mill was idle in June, July, and August, owing to low market prices for lead and zinc and pending the making of new contracts.

**Dunton district.**—At the Emma mine at Dunton retimbering was done and flotation cells were added to the 15-stamp mill, but no ore was treated in 1927. At the Smuggler-Almont mine 232 feet of drifts and 55 feet of crosscuts were driven; the 20-stamp concentrating mill on this property has been idle for 15 years.

#### DOUGLAS COUNTY

**Newlin Gulch district (Parker).**—Pipes were laid for pumping water from the stream bed of Newlin Gulch to the west bench of the gulch; there pits and trenches were dug in the nearly flat-lying Dawson arkose beds where the Castle Rock conglomerate has been eroded. A little gold was recovered from pannings and small sluicing

operations, but none was marketed in 1927. Part of this area is under the control of the State Land Board, which has insisted on the sinking of shafts. This gulch and adjoining gulches leading into Cherry Creek and South Platte River furnished enough gold in 1842 and thereafter to lead the Russell party of 1858, in search of gold, from Georgia to the present site of Denver. Although the results obtained from this reconcentrated arkose were disappointing, they lured the prospectors to the region, whence they followed up the more recent (geologically) stream bed of Clear Creek and in 1859 found rich residual gold surface deposits at Blackhawk and stream and bench gravels at Idaho Springs. Henderson<sup>2</sup> wrote a history of the discovery and of the development of mining in Colorado from 1859 to 1923.

#### EAGLE COUNTY

**Battle Mountain district (Red Cliff, Gilman).**—The Empire Zinc Co. continued development work on its large area of mining property on Battle Mountain. The property is opened by an adit at Belden on the Denver & Rio Grande Western Railroad, in Eagle River Canyon, and by a vertical shaft at Belden. The Iron Mask and Black Iron groups are the chief and best-known claims included in the property. Lead-silver oxidized ore was first discovered here in 1879 in the limestone beds, and shortly thereafter gold ores were discovered in the underlying quartzite. Much manganese iron ore was shipped in the early days of the district. When sulphides were reached the zinc in the ore proved troublesome; in 1905, however, they were handled successfully by magnetic separation. From 1914 to 1918 much zinc-lead sulphide ore was shipped direct to zinc retort and zinc-lead pigment plants. The Empire Zinc Co. acquired part of its property between 1912 and 1914 and has since added to it. It has shipped yearly zinc-lead sulphide ore in considerable quantity (none in 1921) to its magnetic mill at Canon City and iron-silver sulphide ores to smelters in Colorado and Utah. Since October, 1927, no zinc-lead-iron sulphide ore has been shipped to Canon City because of a decision to close down the Canon City magnetic plant (operated continuously since 1902 except from November, 1920, to November, 1922) and to build a flotation mill at Belden. Iron-silver sulphide ores, however, were shipped throughout 1927. Other producing mines in the Battle Mountain district in 1927 were the Ground Hog, Horn Silver, Ovee, and Tram.

**Brush Creek district (Eagle).**—Assessment work was done at the Lady Belle-North Dakota group. During the period 1913 to 1918 this group produced 200,000 ounces of silver from surface and shallow inclined workings in sandstone.

**Fulford district.**—Assessment work was done at the Polar Star group.

**Holy Cross district.**—Assessment work was done on several claims on the flanks of Holy Cross Mountain.

**Lake Creek district (Edwards).**—Persistent reports since 1924 of placer gold deposits on Lake Creek resulted in the examination of the gravels by several engineers in 1927 and in the sinking of several test pits.

**McCoy district.**—Attempts were again made to recover placer gold from stream gravels of Colorado River near McCoy.

<sup>2</sup>Henderson, Chas. W., *Mining in Colorado*: U. S. Geol. Survey Prof. Paper 139, 1926, 263 pp.

IMPORTANT

1941

BLANKS SHOULD BE COMPLETELY FILLED OUT AND RETURNED BY FEBRUARY 1, 1941

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METAL MINES AND MILLS

Name of Mine or Plant St. Louis Tunnel

County Dolores, Post Office \_\_\_\_\_, District \_\_\_\_\_

REPORT TO BUREAU OF MINES

STATE OF COLORADO

FOR THE YEAR 1940

OPERATOR.

Name of Company, Partnership or Individual St. Louis Smelting & Refining Co.

Address of Principal Office 722 Chestnut Street, St. Louis, Missouri

Local Office Rico, Colorado

If incorporated, under the laws of what state? Missouri

Names, titles and addresses of officers, partners.

Name and Address of Owner \_\_\_\_\_

Names and Numbers of patented claims \_\_\_\_\_

If names of claims have been listed in previous reports, only changes, if any, need be given.

Names of unpatented claims \_\_\_\_\_

Total acreage \_\_\_\_\_

Do you own these claims, or do you operate them under lease? Own

Was your property operated in whole or in part during the past year? In part (Development work only)  
If you have given a lease to others for all or part of the property, state the names and P. O. address of the leasing companies, partnerships or individuals, together with the name or description of part leased, next below:

Is the work done by your lessees included in this report? \_\_\_\_\_

Have you a mill or reduction works? No If so, what is its character and capacity? \_\_\_\_\_

List all improvements and developments made during the past year \_\_\_\_\_

PRODUCTION

CRUDE OR SHIPPING ORE: No. tons 73 Average gross value per ton \$ 27.55

Total value \$ 2,011.33 Average grade of different metallic content in ores as follows:

Gold <u>.047</u> oz.	Lead <u>14.4</u> %	Copper <u>.66</u> %	Sulphur _____ %
Silver <u>15.87</u> oz.	Zinc <u>17.4</u> %	Iron _____ %	Insoluble _____ %

MILLING ORE: Tons milled \_\_\_\_\_ Milling processes employed \_\_\_\_\_

Average gross value per ton crude ore milled \$ \_\_\_\_\_ Average grade crude ore milled in different metals as follows:

Gold _____ oz.	Lead _____ %	Copper _____ %	Sulphur _____ %
Silver _____ oz.	Zinc _____ %	Iron _____ %	Insoluble _____ %

CONCENTRATES: No. tons concentrates obtained from ores milled \_\_\_\_\_ Ratio of reduction \_\_\_\_\_ tons into 1. Average value per ton concentrates \$ \_\_\_\_\_ Total value \$ \_\_\_\_\_

Average grade concentrates in the different metals as follows:

Gold _____ oz.	Lead _____ %	Copper _____ %	Sulphur _____ %
Silver _____ oz.	Zinc _____ %	Iron _____ %	Insoluble _____ %

State average costs per ton for mining \$ \_\_\_\_\_, hauling \$ \_\_\_\_\_, freight \$ \_\_\_\_\_, milling \$ \_\_\_\_\_, smelting \$ \_\_\_\_\_.

RIC000000020

If any of the following metals are produced, give percentage, amount and value of each as follows:

Tungsten \_\_\_\_\_%, amount \_\_\_\_\_, value \$\_\_\_\_\_. Uranium \_\_\_\_\_%, amount \_\_\_\_\_, value \$\_\_\_\_\_. Vanadium \_\_\_\_\_%, amount \_\_\_\_\_, value \$\_\_\_\_\_. Molybdenum \_\_\_\_\_%, amount \_\_\_\_\_, value \$\_\_\_\_\_. Fluorspar \_\_\_\_\_%, amount \_\_\_\_\_, value \$\_\_\_\_\_.

# LABOR DATA

MINE					MINE OTHER SURFACE		
No. of Days Operated	Average Number of Men Employed and Shifts Worked				No. of Days Operated	Average Number of Men Employed and Shifts Worked	
	Underground	No. of Shifts	Surface	No. of Shifts		No. of Men	No. of Shifts
50	20	1006	2	65	50	1	79
			2	144			

## CLASSIFICATION OF LABOR IN AND ABOUT METAL MINES

UNDERGROUND			SURFACE		
	Total # hr. Shifts	Wage per Shift		Total # hr. Shifts	Wage per Shift
Miners	334	\$ 5.25	Topmen		\$
Machine Runners		\$	Engineers		\$
Machine Helpers		\$	Firemen		\$
Trammers & Muckers	594	\$ 4.75	Machinists		\$
Cagers		\$	Blacksmiths	48	\$ 5.75
Timbermen	33	\$ 5.25	Carpenters	7	\$ 5.25
Pumpmen		\$	Superintendents		\$
Electricians	45	\$ 5.25	Foremen		\$
Other Underg'nd Labor		\$	Shift Bosses Other	10	\$ 4.00

Total number of shifts performed by all men employed underground 1006

Total number of shifts performed by all men employed on surface 65 144

## Classification of Labor in and About Mills and Other Surface Occupations

	Total # hr. Shifts	Wage per Shift		Total # hr. Shifts	Wage per Shift
Mill Superintendents		\$	Ore Sorters		\$
Mill Foremen		\$	Tram Men		\$
Mill Shift Bosses		\$	Teamsters		\$
Millmen		\$	Timekeepers		\$
Roustabouts		\$	Bookkeepers	79	\$ 5.00
Machinists		\$	Storekeepers		\$
Electricians		\$	Cooks		\$
Carpenters		\$	Waiters		\$

Total number of shifts performed by all men employed in Mills, etc. None

Total cost of operations during the year. If this cannot be given accurately, give approximately:

Approximately \$2,000.00

Remarks:

Dated at St. Louis, Mo

19

Signed St. Louis Smelting & Refining Co

By C. L. Lusk

Title Secretary

RIC000000021

RICO ARGENTINE MINING CO.  
Rico, Colorado.

The following patented and unpatented lode mining claims located in Pioneer Mining District, Dolores County, Colorado:

Patented

Royal Tiger, Survey No. 1190  
Wide Awake, Survey No. 366  
Avalanche, Survey No. 1682  
D. B. Lode, Survey No. 1980  
Jas. C. Blaine, Survey No. 15233  
Humbolt, Survey No. 15233  
Black Hawk, Survey No. 2060  
Little Leggie, Survey No. 1211  
Connecting Link, Survey No. 1310  
Allegheny, Survey No. 1255  
Elliott Mill Site, Survey No. 1536-B  
Lillie Bernard, Survey No. 6406  
Leila Davis, Survey No. 1256  
Rico, Survey No. 1859  
Missouri, Survey No. 7898

Approximately 150 acres.

Unpatented

Wedge, Black Hawk Extension, Divide, Trail's End,  
Triangle Amended, Last Chance, Shorty Amended,  
Ophir, Salt Lake Amended, Fraction, Uintah  
Amended, U. S. No. 1 and U. S. No. 2.

Approximately 130 acres.

RIC000000022

RIC000000047

176  
METAL MINES AND MILLS  
County Delaware Post Office Elfrida District Pioneer  
Name of Mine or Plant Silver Brook

## REPORT TO BUREAU OF MINES

STATE OF COLORADO

FOR THE YEAR 1927

Name of Company or  
Title of Partnership

Address of Principal Office

Names, titles and ad-  
dresses of officers,  
partners or owners

St. Louis Smelting and Refining Co.  
International Life Bldg St. Louis Mo.  
Mr. J. H. Caulton  
Chas. E. Schwan  
Geo. O. Carpenter, President St. Louis  
Missouri

Names and numbers of patented claims

If names of claims  
have been listed in  
previous reports,  
only changes, if  
any, need be given.

Total acreage

Names of unpatented claims

Total acreage

Do you own these claims, or do you operate them under lease?

Operate under lease

If you operate under lease, give name and address of company or person from whom leased.

H. J. and E. E. Day, Rico Colorado

If you have given a lease to others for all or part of the property, state the names of the leasing companies, partnerships or individuals:

Name Manager Address

None

Is the work done by your lessees included in this report?

Have you a mill or reduction works; No If so, what is its character and capacity?

Average contents of products sold. (If both crude ore and concentrates are sold, give average contents of each.)

Gold <u>.02</u> oz.	Copper <u>.5</u> %	Iron <u>20</u> %	Tungstic acid <u>1</u> %
Silver <u>8.0</u> oz.	Zinc <u>12</u> %	Sulphur <u>1.0</u> %	Uranium oxide <u>—</u> %
Lead <u>12</u> %	Manganese <u>—</u> %	Insoluble <u>35</u> %	Vanadium oxide <u>—</u> %
Molybdenum <u>—</u> %	Fluorspar <u>—</u> %		

Crude ore sold 13148 tons Concentrates sold — tons Milling ore produced — tons

Gold or silver bullion produced, value

List of buildings, tramways, and other surface improvements made during the year, New Ore  
bin, Hoist, Compressor, Compressor House

Amount and character of underground development during year:

Shafts — ft

Winzes — ft Raises 1600 ft Drifts 1900 ft Crosscuts 650 ft

RIC000000048

# LABOR DATA

STATE OF COLORADO

Name of Mine or Plant	County	City or Town	State	No. of Days Operated	Average Number of Men Employed	Underground	Surface
<i>Swan Mine</i>	<i>Delta</i>	<i>Delta</i>	<i>CO</i>	<i>11</i>	<i>56.2</i>		

## ORE DRESSING PLANTS AND MILLS

At Mill

*Ore sold to International Smelting Co. - 12*

## CLASSIFICATION OF LABOR UNDERGROUND AND ON SURFACE ABOUT METAL MINES

	Total No. Shifts	Wage per Shift		Total No. Shifts	Wage per Shift
Miners	11	46.4	Nippers	1	4.50-163
Machine Runners			Other Underg'nd Labor		
Machine Helpers			Topmen		
Trammers	7	25.48	Engineers	2548	4.50-1146
Muckers	21	73.66	Firemen		
Cagers			Machinists		
Timbermen	6	21.94	Blacksmiths	364	5.00-284
Timbermen Helpers			Blacksmith's Helpers		
Pumpmen			Carpenters		
Pipemen			Superintendents		
Electricians			Foremen	364	5.00-24
Motormen			Shift Bosses	728	5.75-418

Total number of shifts performed by all men employed underground: *20120*  
 Total number of shifts performed by all men employed on surface: *20120*

## CLASSIFICATION OF LABOR IN ORE DRESSING PLANTS, MILLS AND OTHER SURFACE OCCUPATIONS

	Total No. Shifts	Wage per Shift		Total No. Shifts	Wage per Shift
Mill Superintendents			Ore Sorters		
Mill Foremen			Tram Men		
Mill Shift Bosses			Teamsters		
Millmen			Timekeepers		
Roustabouts			Bookkeepers		
Machinists			Storekeepers		
Electricians			Cooks		
Carpenters			Waiters		

Total number of shifts performed by all men employed in Mills, etc. *20120*  
 Remarks: *See Mr. Serrano & Pigeon Mine Report for full description*  
 Dated at *Delta, Colo.* *7/27*, 1928  
 Signed *Swan M. Mine*  
 Title *Superintendent*

NOTE.—PLEASE FILL OUT THIS REPORT COMPLETELY. DO NOT NEGLECT TO GIVE NUMBER OF DAYS OPERATED AND AVERAGE NUMBER OF MEN EMPLOYED. BE SURE TO DATE THE REPORT, AND SIGN IT.

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30  
30

METAL MINES AND MILLS

Name of Mine or Plant Silver Spruce & Wellington  
County DOLGUES COUNTY Post Office Rice District ...

REPORT TO BUREAU OF MINES  
STATE OF COLORADO  
FOR THE YEAR 1929

OPERATOR.

Name of Company, Partnership or Individuals } St. Louis Smelting & Refining Co.  
Address of Principal Office 722 Chestnut St. St. Louis, Mo.  
Local Office Rice Colorado

Names, titles and addresses of officers, partners.  
E. J. ...  
J. A. ...  
W. H. ...

Name and Address of Owner Same as operator

Names and numbers of patented claims

If names of claims have been listed in previous reports, only changes, if any, need be given.

Names of unpatented claims

Total acreage

Total acreage

Do you own these claims, or do you operate them under lease?  
Was your property operated in whole or in part during the past year? In part  
If it was not so operated, the following interrogatories should not be answered. Otherwise they must be answered fully.  
If you operate under lease, in whole or in part, give name and address of company or person from whom leased  
If you have given a lease to others for all or part of the property, state the names and P. O. address of the leasing companies, partnerships or individuals, together with the name or description of part leased, next below:

Is the work done by your lessees included in this report?  
Have you a mill or reduction works? No If so, what is its character and capacity?

List all improvements and developments made during the past year

PRODUCTION

CRUDE OR SHIPPING ORE: No. tons 111.6 Average gross value per ton \$ 35.00  
Total value \$ 280,720.00 Average grade of different metallic content in ores as follows:  
Gold 0.0105 oz. Lead 2.38 % Copper 0.94 % Sulphur %  
Silver 14.58 oz. Zinc 1.82 % Iron % Insoluble %  
MILLING ORE: Tons milled None Milling processes employed  
Average gross value per ton crude ore milled \$ Average grade crude ore milled in different metals as follows:  
Gold oz. Lead % Copper % Sulphur %  
Silver oz. Zinc % Iron % Insoluble %  
CONCENTRATES: No. tons concentrates obtained from ores milled Ratio of reduction  
tons into 1. Average value per ton concentrates \$ Total value \$  
Average grade concentrates in the different metals as follows:  
Gold oz. Lead % Copper % Sulphur %  
Silver oz. Zinc % Iron % Insoluble %  
In all kinds of concentrates made, give character, tonnage and average value in all metals combined of each as follows: Lead, No. tons value \$ Zinc, No. tons value \$  
Copper, No. tons value \$ State average costs per ton for mining \$ hauling \$ freight \$ State average costs per ton for smelting \$

280,720

RIC000000050

If any of the following metals are produced, give percentage, amount and value of each as follows:

Tungsten — % , amount . . . . . , value \$ . . . . . Uranium — % , amount . . . . .  
 . . . . . , value \$ . . . . . Vanadium — % , amount . . . . . , value \$ . . . . .  
 Molybdenum — % , amount . . . . . , value \$ . . . . . Fluorspar — % ,  
 amount . . . . . , value \$ . . . . .

### LABOR DATA

MINE					MILL		
No. of Days Operated	Average Number of Men Employed and Shifts Worked				No. of Days Operated	Average Number of Men Employed and Shifts Worked	
	Underground	No. of Shifts	Surface	No. of Shifts		No. of Men	No. of Shifts
365	42	15,445	8	3066		None	

### CLASSIFICATION OF LABOR IN AND ABOUT METAL MINES

UNDERGROUND			SURFACE		
	Total & hr. Shifts	Wage per Shift		Total & hr. Shifts	Wage per Shift
Miners		\$	Topmen	657	\$ 31.32
Machine Runners	5571	\$ 30.032	Engineers		\$
Machine Helpers		\$	Firemen		\$
Trammers & Muckers	7348	\$ 35.634	Machinists		\$
Cagers	255	\$ 12.75	Blacksmiths	340	\$ 2,240
Timbermen	1022	\$ 5.493	Carpenters	61	\$ 394
FOREMEN	1022	\$ 6.698	OTHER SURFACE LABOR	669	\$ 28.17
Electricians	227	\$ 16.37	Superintendents	1332	\$ 3836
Other Underg'nd Labor		\$	Foremen		\$
			Shift Bosses		\$

Total number of shifts performed by all men employed underground 15,445

Total number of shifts performed by all men employed on surface 3,066

### CLASSIFICATION OF LABOR IN ORE DRESSING PLANTS, MILLS AND OTHER SURFACE OCCUPATIONS

	Total & hr. Shifts	Wage per Shift		Total & hr. Shifts	Wage per Shift
Mill Superintendents		\$	Ore Sorters		\$
Mill Foremen		\$	Tram Men		\$
Mill Shift Bosses		\$	Teamsters		\$
Millmen		\$	Timekeepers		\$
Roustabouts		\$	Bookkeepers		\$
Machinists		\$	Storekeepers		\$
Electricians		\$	Cooks		\$
Carpenters		\$	Waiters		\$

Total number of shifts performed by all men employed in Mills, etc.

Remarks:

The gross value per ton of ore represents the sale value before deducting freight and treatment charges. The net value per ton of ore represents the sale value for mine. The total net value represents the sale value for mine.

Dated at St. Louis, Mo.  
 Feb. 27, 1920

Signed ST. LOUIS SMELTING & REFINING  
 By, [Signature]

RIC000000051

# MINERAL MINES AND MILLS

County DOLGRES COUNTY, Post Office                     , District                     

Name of Mine or Plant Hellington & Swan Groups

## REPORT TO BUREAU OF MINES

STATE OF COLORADO

FOR THE YEAR 1928

Name of Company or Title of Partnership St. Louis Smelting & Refining Co.

Address of Principal Office 722 Chestnut St., St. Louis, Mo.

Local Office Rico, Colo.

Names, titles and addresses of officers, partners or owners  
E. J. Cornish, Pres., 111 Broadway, N.Y. City; J. A. Caselt  
V. Pres. & Sec., 722 Chestnut St., St. Louis, Mo.  
O. H. Greene, Treas., 722 Chestnut St., St. Louis, Mo.

Names and numbers of patented claims

If names of claims have been listed in previous reports, only changes, if any, need be given.

Names of unpatented claims

Total acreage

Total acreage

Was your property operated in whole or in part during the past year? in part

If it was not so operated, the following interrogatories should not be answered. Otherwise they must be answered fully.

Do you own these claims, or do you operate them under lease?

If you operate under lease, in whole or in part, give name and address of company or person from whom leased.

If you have given a lease to others for all or part of the property, state the names of the leasing companies, partnerships or individuals, together with the name or description of part leased:

Name

Manager

P. O. Address

Is the work done by your lessees included in this report?

Have you a mill or reduction works? If so, what is its character and capacity?

### PRODUCTION

CRUDE OR SHIPPING ORE: No. tons 14003 net  
 Average value per gross ton \$ 12.05 Av. gross value per ton 17.68  
 Average grade of different metallic content in ores as follows:

Gold 0.0235 oz. Lead 14.3 % Copper 0.25 % Sulphur %  
 Silver 8.67 oz. Zinc 12.9 % Iron % Insoluble %

MILLING ORE: Tons milled none Milling processes employed

Average value per gross ton crude ore milled \$ Average grade crude ore milled in different metals as follows:

Gold oz. Lead % Copper % Sulphur %  
 Silver oz. Zinc % Iron % Insoluble %

CONCENTRATES: No. tons concentrates obtained from ores milled Ratio of reduction  
 tons into 1. Average value per ton concentrates \$ Average grade concentrates in the different metals as follows:

Gold oz. Lead % Copper % Sulphur %  
 Silver oz. Zinc % Iron % Insoluble %

If two or more kinds of concentrates are made, give character, tonnage and average value in all metals combined of each as follows: Lead, No. tons value \$ Zinc, No. tons value \$  
 value \$ Copper, No. tons value \$  
 \$, smelting \$, freight \$

RIC000000052

If any of the following metals are produced, give percentage, amount and value of each as follows:

Tungsten.....%, amount....., value \$..... Uranium.....%, amount.....  
 ....., value \$..... Vanadium.....%, amount....., value \$.....  
 Molybdenum.....%, amount....., value \$..... Fluorspar.....%,  
 amount....., value \$.....

# LABOR DATA UNDERGROUND MINES

Name of Mine or Plant	County	Post Office	Shipping Point	No. of Days Operated	Average Number of Men Employed	
					Underground	Surface
Wellington & Swan	Dolores	Rico	Rico	366	48	* 17

## ORE-DRESSING PLANTS AND MILLS

At Mill

## CLASSIFICATION OF LABOR UNDERGROUND AND ON SURFACE ABOUT METAL MINES

	Total # hr. Shifts	Wage per Shift		Total # hr. Shifts	Wage per Shift
Miners		\$	Nippers	270	\$ 4.50
Machine Runners	6547	\$ 5.00	Other Underg'nd Labor	606	\$ 5.00
Machine Helpers		\$	<del>Other Surface "</del>	829	\$ 4.50
Trammers	2717	\$ 5.00	<del>Other</del> Sorters	2107	\$ 4.50
Muckers	4742	\$ 4.50	Firemen		\$
Cagers		\$	Machinists		\$
Timbermen	1406	\$ 5.00	Blacksmiths	701	\$ 6.00
Timbermen Helpers	217	\$ 4.50	Blacksmith's Helpers		\$
Pumpmen		\$	Carpenters	94	\$ 6.70
Pipemen	34	\$ 5.00	Superintendents	1 at \$300.00 per month	
Electricians	228	\$ 7.35	Foremen	738	\$ 6.75
<del>Machinists</del> Helpers	253	\$ 4.50	Shift Bosses	570	\$ 6.00

Total number of shifts performed by all men employed underground 17714

Total number of shifts performed by all men employed on surface 4346 + 1326 = 5671

## CLASSIFICATION OF LABOR IN REPORTS IN PLANTS, MILLS AND OTHER SURFACE OCCUPATIONS

	Total # hr. Shifts	Wage per Shift		Total # hr. Shifts	Wage per Shift
Mill Superintendents		\$	Ore Sorters		\$
Mill Foremen		\$	Tram Men		\$
Mill Shift Bosses		\$	Teamsters		\$
Millmen		\$	Timekeepers		\$
Roustabouts		\$	Bookkeepers	1 at \$160.00 month	
Machinists		\$	Storekeepers	1 " 150.00 "	
Electricians		\$	Cooks	368	\$ 5.75
Carpenters		\$	Waiters	592	\$ 2.75
		\$	Dishwashers	366	\$ 3.50

## In Other Surface occupations

Total number of shifts performed by all men employed in other surface occupations 1326

Remarks:

\* Includes superintendent, bookkeeper, storekeeper, cooks, waiters and dishwashers.

Dated at St. Louis, Mo.,  
 March 19, 1929

Signed ST. LOUIS SMELTING & REFINING CO

By *W. H. Heston*  
 Title Vice-President.

NOTE.—PLEASE FILL OUT THIS REPORT COMPLETELY. DO NOT NEGLECT TO GIVE NUMBER OF DAYS OPERATED AND AVERAGE NUMBER OF MEN EMPLOYED. BE SURE TO DATE THE REPORT, AND SIGN IT.

R1C00000053

INTERNATIONAL EDITION  
**THE MINES HANDBOOK**

SUCCEEDING  
THE COPPER HANDBOOK  
Founded by Horace J. Stevens, 1900  
DESCRIBING  
THE MINING COMPANIES OF THE WORLD

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BY  
**WALTER HARVEY WEED, E. M.**

Former Geologist in the United States Geological Survey, 1883-1906;  
Member of Mining and Metallurgical Society of America;  
Fellow Geological Society of America; Author: Copper  
Mines of the World; Geology of Butte,  
Montana; Classification of Ore  
Deposits, etc.

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by Walter Harvey Weed

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**VOL. XV**

Supplementing Volumes I to XIV

Price \$15.00

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PUBLISHED BY  
**THE MINES HANDBOOK CO.**

Tuckahoe, N. Y.

1922

*See  
Price - 4.00 for*

RIC00000781

balance in property. Outstanding debts, Feb., 1917, \$118,389. No financial information received since.

**Property:** the Greenhorn group, 19 claims, 6 patented, together with one milisite, total 65 acres; also 120 acres held by location, making 185 acres mineral land in the Hardscrabble district, Custer county.

**Development:** by tunnel showing a vein of zinciferous copper and lead ore with small gold and silver values. Has water power, compressor and 100-ton concentrating mill. Erected a 100-ton flotation plant to treat tailings in 1915.

Idle several years.

**MARLIN MNG., MLG. & POWER CO.**

COLORADO

Address: J. W. Thomas, supt., Montezuma, Colo.

**Property:** the Marlin gold-silver mine at Montezuma, Summit county.

Operated during part of 1919, and work reported resumed late in 1921.

**MARMATITE MINING & LEASING CO.**

COLORADO

Address: H. M. Fields, pres., Rico, Colo. E. H. Snyder, mgr.

**Property:** a lease on the Blackhawk mine, owned by the Rico-Argentine Co., also on the Pro Patria mine of the Syndicate M. & M. Co., and the Silver Swan mine. The Enterprise vein of the Silver Swan is being opened. Ore contains gold, lead, zinc, and silver. Reported shipping at rate of two cars per day in 1919, to the Durango smelter. Operations were curtailed during 1920 on account of the apex suit started by the Rico Cons. M. Co. This was settled in Jan., 1921, Marmatite paying \$7,346 and Rico Argentine, \$29,946, representing net value of 5,000 tons of ore extracted from Rico Cons. ground.

Company controls the Marmatite M. Co., which operates the Emma gold-silver mine at Dunton.

**MARSHALL & RUSSELL GOLD M. M. & T. CO.**

COLORADO

Out of Business. See Vol. XII.

**MARTIN MINING AND POWER CO.**

COLORADO

Fully described in Volume XIV. Holdings acquired, October, 1920, by Treasure Mountain Mines, Inc., which see.

**MARYANA MINING & LEASING CO.**

COLORADO

Mail returned unclaimed, July, 1919, from former address, Cripple Creek, Colo. Probably dead.

Inc. in 1914. Company had a lease on the Mary McKinney mine from the 8th level down.

**MARY FLORENCE MNG., MLG. & LEASING CO.**

COLORADO

Address: 758 Corona St. Denver, Colo.

**Property:** gold-silver claims at Parshall, Grand county. Operated during 1919, but made no shipments.

**MARYLAND MINES & RED. CO.**

COLORADO

Address: 1143 Larimer St., Denver, Colo. Mine address: Rollinsville, Colo.

**Officers:** W. N. MacPhail, pres.; J. Miller, v. p.; H. F. Christensen, sec.-treas.

**Property:** Maryland group of 22 acres in South Boulder district, Gilpin county. Ore reported to average \$12 per ton in gold and copper.

**MARY MCKINNEY MINING CO.**

COLORADO

Address: Colorado Springs, or Box 1346, Cripple Creek, Colo.

**Officers:** Chas. Castello pres., gen. mgr.; Daniel Thatcher, v. p.; John L. Nichols, sec.-treas.; with J. H. Nichols, and W. H. Spurgeon, directors.

Inc. March 30, 1892, in Colorado; renewed March, 1912. Cap. \$1,500,000; shares \$1 par; outstanding June, 1918, \$1,409,252. Transfer office: Colorado Title & Trust Co., Colorado Springs. Annual meeting, 2nd Monday in February. Listed on Colorado Springs Exchange.

RIC000000782

**RESERVE MINING CO.****COLORADO**

Office: 840 Gas &amp; Electric Bldg., Denver, Col.

Property: the Hoil gold-silver mine at Alma, Park county. Operated part of 1919; idle in 1920-21.

**RESOLUTE MINING CO.****COLORADO**

Address: J. A. Houghton, pres., 54 De Menil Bldg., St. Louis, Mo.

Mine address: Rico, Dolores county, Colo.

Property: Telegraph, Newman and Expectation groups, near Rico. Idle several years.

**REVA GOLD MINING CO.****COLORADO**

Address: 935 Foster Bldg., Denver; or G. R. Calhoun, supt., Cripple Creek, Colo.

Property: operating under lease, the Rose Nicol mine of Rose Nicol Gold Mining Co., Battle mountain, Cripple Creek, Teller county.

Development: by 1,200' shaft and several thousand feet of workings. Ore has been opened on No. 6 and 7 levels, at 800' and 1,000' below the surface, respectively, and on Roosevelt tunnel-level about 2,100' below the collar of shaft. In 1920, ore opened on No. 10 level yielded \$25 to \$71 per ton.

Equipment: includes aerial tram extending from mine to Midland Ry. terminal. Ore is treated at the Golden Cycle mill at Colorado Springs.

**REVENUE TUNNEL MINES CO.****COLORADO**

Address: Carl J. Sigfrid, Ouray, Ouray county, Colo.

Property: controlled by the Reynolds Estate of Denver. Includes the Cumberland, Revenue-Virginus, and Wheel of Fortune mines. Extensive development work was done in 1918, and the Cumberland mine shipped silver-lead ore. The Revenue-Virginus is credited with a total production of \$26,000,000. The Wheel of Fortune mine, located in 1875, has been worked for varying periods and is to be operated with the Revenue.

**REVILS MINING & INVESTMENT CO.****COLORADO**

Idle since 1918.

Address: Silver Cliff, Custer county, Colo.

Property: the Hornsilver Consolidated mine just E. of Silver Cliff in the Hardscrabble district, operated under bond and lease. Ore carries silver and manganese.

**REX GOLD MINING & MILLING CO.****COLORADO**

Properties are leased to Lincoln Mines &amp; Reduction Co., which see.

Address: Cripple Creek, Teller county, Colo.

**REY SILVER MINES CO.****COLORADO**

Idle in 1920-21. Address: Fairplay, Park Co., Colo. Mine at Alma, Sacramento district, reported to have opened a 12 to 15' silver vein, assaying \$50 per ton in 1919. The ore is believed to be on the London contact, which underlies several properties in that section. There were 31 sets of lessees working on the London.

**RICHMOND HILL MINING, MILLING & LEASING CO.****COLO.**

Address: Aspen, Pitkin county, Colo.

Officers: W. H. Cornwall, pres.; C. E. Doolittle, v. p.; F. M. Yates, sec.-treas., with Jos. Mellor and A. Johnson, directors.

Property: company has a lease and option on the Little Annie silver-lead mine and mill at Aspen. Dump was said to contain 5,000 tons of payable ore, besides 4,000 tons of ore broken in the mine. Operated part of 1919 and shipped products to smelter. The mill was enlarged to 80 tons per day during 1920.

**RICO ARGENTINE MINING CO.****COLORADO**

Office: Mackintosh Block, Salt Lake City, Utah. Mine address: J. M. Stempel, supt., Rico, Dolores Co., Colo.

Officers: F. W. Price, pres.; A. E. Rykert, v. p.; J. H. Woodmansee, sec.-treas., with S. A. King, J. E. McKnight, N. S. Nielson and I. E. Frick, directors.

Inc. 1912, in Utah. Cap. \$100,000; 10¢ par; 963,136 issued; assessable; assessment No. 10 of 1¢ per share levied March 26, 1921. Company is its

own transfer agent and registrar. Listed on Salt Lake Exchange.

**Property:** the Blackhawk and Argentine groups, 21 claims, 145 acres, mostly patented, adjoining the Rico-Wellington Mining Co. property.

**Geology:** alternating strata of limestone and sandstone, dipping at angle of about 30° and cut by almost vertical fissures of great extent and persistence. Where these fissures cross the soluble limestone they contain flat replacement deposits of sulphide ores, carrying copper, zinc, and lead, with gold and silver values. The ore shoots or bedded deposits are from 3-30' thick. These fissures and the limestone are identical both in character and occurrence with those which are producing in the Rico-Wellington property. In the apex suit with the Rico Consolidated, the Rico Argentine held that the Blackhawk fissure was the source of the enrichment of the beds that had been followed into the disputed ground, in other words, it was the master vein. Judge Searcy decided January, 1921, that the ore-beds were formed by E.-W. fissures rather than by the Blackhawk. This reverses the generally accepted local theory.

**Development:** by a new tunnel, 200' lower than former workings, that drained the main shoot through to a connection with upper workings. In 1918, it was reported that bismuth was appearing in some of the ore. A tunnel was driven 700' in the ground in dispute with the Rico Cons. and opened silver-lead-copper shipping ore.

**Production:** for 1917, \$100,000; the net smelter returns of which were \$88,837. Of this, \$47,576 was for ore shipped by company and \$41,261, shipped by lessees. On January 1, 1919, company operations were suspended until September, but lessees continued shipping at rate of 1,000 tons per month.

Late in 1918 the Rico Consolidated M. Co. brought suit against the Rico Argentine Co. and Marmatite Leasing Co. over apex rights for wrongful extraction of 15,000 tons of ore, worth \$900,000. In October, 1920, the plaintiff agreed to modify the amount, provided the ore had been mined in good faith. Judgment was rendered in Jan., 1921, against the Rico Argentine, which had to pay \$29,946, and the Marmatite, \$7,346. This represents 5,000 tons of \$740 ore, net value.

All operations suspended, pending final decision of appeal.

#### RICO CONSOLIDATED MINES CO.

COLORADO

Owned by Knight interests of Provo, Utah. **Mine address:** Rico, Dolores Co., Colo. Stock listed on Salt Lake City Exchange.

**Property:** adjoining the Rico Argentine on the N. E., is said to show a vein of copper-silver-lead ore 35' wide in the upper workings. For geology see the Rico Argentine.

**Development:** by tunnel over 300' long. Shipments have been made, but no figures are available.

Company brought suit in 1918 against the Marmatite Leasing and the Rico Argentine companies, alleging that they had trespassed on the Allegheny lode. Company claims that 15,000 tons of ore valued at \$60 per ton, amounting to \$900,000 had been shipped. This was modified in Oct., 1920, to \$37,000, provided that the ore had been extracted in good faith. In Jan., 1921, judgment was rendered in favor of the Rico Consolidated for \$37,000, the net value of 5,000 tons.

#### RICO MINING CO.

COLORADO

Reorganized as Syndicate Mining & Milling Co., which see.

#### RICO-WELLINGTON MINING CO.

COLORADO

**Address:** 11 Knight Block, Provo, Utah.

**Officers:** O. Raymond Knight, pres.; Chas. Read, v. p.; R. E. Allen, sec.-treas.; R. L. Anderberg, asst. sec.-treas.; H. R. Trenholm, gen. mgr. **Directors:** O. Raymond Knight, J. W. Knight, Chas. Read, K. S. Jordan, W. L. Mangum, R. E. Allen, H. R. Trenholm. Albert Lofquist, supt.

**Inc.** August, 1911, in Utah. **Cap.** \$1,000,000; \$1 par; assessable: 51% of stock owned by Knight Investment Co. Listed on Salt Lake Exchange.

Since the property was taken over by its present owners it has earned

over \$500,000, has invested \$50,000 in a mill and expended \$100,000 in development work. The debt of \$150,000 advanced for this equipment and work was paid off in 1916. Early in 1921, company owed the bank \$80,000, and an assessment of 10¢ a share was levied.

**Dividends:** on April 25, 1917, No. 1 of 1½¢ per share was paid, and a total of 8½¢ in that year; \$39,000 paid to date.

**Property:** the Wellington mine, at Rico, Dolores county, which contains ore-shoots formed by replacement and contact metamorphism in the limestone beds of the middle member of the Hermosa formation. In 1914 a flat deposit of zinc-lead ore was cut. It lies parallel to the Blackhawk fault. To the north the orebody is cut off by a cross fault parallel to the Nellie Bly fault, the orebody north of the fault being 170' below. Across the Blackhawk fault a copper deposit, replacing limestone and broken by several faults, has been opened, the ore carrying good values in copper and silver.

**Development:** by the Mountain Spring tunnel and about 22,000' of work, said to expose large amounts of lead-zinc and copper ore. Exploration is devoted to the Blackhawk and Iron veins, two great ore-bearing fissures, traversing the property N. W. and S. E. In these the ore makes in lime beds that look almost like coal deposits, and as many as 5 and 6 beds, one above the other, have been opened.

In 1921, ore as mined was 30' wide, 6' high and of unknown extent on its strike. Shipments averaged 18 oz. silver per ton, and 7% lead. The high grade ore mined in 1920 was faulted. The large body of pyrite ore is mined and sold as flux.

**Equipment:** includes a compressor and 2,500' tram to the Rio Grande railroad, handling 50 tons of ore per hour at a cost of 23¢ per ton. The 100-ton mill formerly belonging to the Pro Patria Co. and leased for 5 years, was remodeled at a cost of nearly \$30,000. A tube-mill, 5 Deister tables, 6 Callow tanks, 2 Callow screens and electrical equipment were installed in 1918.

**Production:** for 1917, 424 tons of copper ore, 1,826 tons of lead-zinc, 709 tons iron sulphide, and 1,687 tons lead-silver, all dry weights, net value, \$105,589. No work was reported for 1918, but company was operating in 1919 and 1920, shipping lead carbonate and pyrite.

#### RILLA MINING CO.

COLORADO

Mail returned unclaimed and company presumably out of business. Described in Volume XIV.

#### RITO SECO GOLD MINE

COLORADO

Fifty-one per cent. of stock owned by Assets Realizing Mines Corp. of California, which see.

**Address:** 811 Merchants National Bank Bldg., Los Angeles, Calif.

**Property:** about 800 acres, patented, near San Luis, in Costilla county.

**Development:** shafts, tunnels, crosscuts and drifts, claimed to have proved 5,900,000 tons of ore, which will be mined by steam shovel and treated in a flotation plant, to have a capacity of 1,250 tons daily.

Idle, owing to high costs.

#### RITTENHOUSE MINE

COLORADO

**Address:** P. O. Box 36, Colorado Springs, Colo. A gold mine in Cripple Creek district. Teller county operated during part of 1920.

#### RIVER SMELTING & REFINING CO.

COLORADO

Affiliated with National Lead Co.

**Works address:** H. H. Utlev, mgr. and ore purchaser, Florence, Colo.; Louis V. Emanuel, supt.

**Office:** 722 Chestnut St., St. Louis, Mo.

**Officers:** Edw. J. Cornish, pres.; J. A. Caselton, sec.-treas.

Organized about 1913 jointly by National Lead and Stone & Webster, of Boston.

Operates a custom zinc smelter for treatment of complex Colorado ores, carrying zinc, lead, silver, gold and copper. Ores are reduced in a reverberatory furnace after partial desulphurization. Its products are zinc-



\$25 a ton. In other sections, silver is reported as running from 150 to 500 oz. per ton. Principal veins are in gneiss and pegmatite.

**Development:** by Sceptre tunnel, 3,200' long; Grant, 1,000' long, and Sunburst, 900'. A 380' raise from Sceptre to Grant and Sunburst tunnels was completed in 1918. The main tunnel was re-timbered in 1919, and lessees opened some rich silver ore.

**Equipment:** includes compressor, transformer, blacksmith shop. Aerial tram, 6,935' long connecting loading station with Col. & Southern R. R. at Georgetown, costing \$25,000, was completed early in 1919.

Operated by lessees; no shipments made in 1920.

#### SUN-MOON LEASING CO.

COLORADO

Fully described in Volume XIV. Mine operated by Hill Top S. M. Co., which see.

#### SUNNYSIDE GOLD MINES CO.

COLORADO

Defunct. Property taken over by The Sunnyside Mining & Milling Co., a subsidiary of the U. S. S. R. & M. Co.

#### SUNNYSIDE MINING & MILLING CO., THE

COLORADO

Fully described under own title in Vol. XIV. Subsidiary of the U. S. Smelting, Refining & Mining Co., which see.

#### SUNSET MILLING CO.

COLORADO

Address: Sunset, Colo.

Property: Lalla Rookh gold-silver mine at Sunset, Boulder county, operated during part of 1920.

#### SUN TUNGSTEN CO.

COLORADO

No work done since 1917. Was a G. R. Q. proposition and not favorably regarded. Described in Volume XIV.

#### SURETY GOLD MINING CO.

COLORADO

Address: Idaho Springs, Colo.

Property: the Orinoco gold-silver mine at Idaho Springs, Clear Creek county.

Operated during 1919-'20, and '21.

#### SWARTHMORE CONSOLIDATED MINING CO.

COLORADO

Officers: Chas. B. Galbreath, pres.; Harvey Hanes, v. p.; J. E. Carpenter, sec.; Paul Barriclow, treas., at last accounts.

Inc. July, 1907, in Colorado, as a merger of the Swarthmore Copper Co and Enterprise Mining Co. Cap. \$3,500,000; \$1 par.

Property: 17 claims, 11 patented, 60 acres, near Eldora, Boulder county, includes the Golden Fleece mine, having fissure veins in pre-Cambrian gneiss cut by dikes. Vein said to average 8' wide and to carry a paystreak of 3 to 5% copper ore with occasional telluride of gold.

**Development:** by 5 shafts, deepest 403', and by tunnels of 800', 1,000' and 2,000'.

**Equipment:** includes 2 small steam plants, a 60-h. p. hoist and a 12-drill air-compressor, a small concentrator with a 50-ton chlorination plant, and 4 mine buildings.

Property leased to Consolidated Leasing Co. since 1917.

#### SWEET HOME MINE

COLORADO

Address: Kasel & Bartos, lessees, Alma, Colo.

Property: at Alma, Park county, contains silver-copper-lead bearing ore. Operated during part of 1920.

#### SYNDICATE MINING & MILLING CO.

COLORADO

Mine office: Rico, Dolores county, Colo. Geo. E. Hicks, supt.

Is a reorganization of the Rico Mining Co., whose property was sold October 29, 1917, to a reorganization committee and transferred to the Synd. M. & M. Co., a corporation capitalized at \$500,000.

Property: 156 claims, 1,110 acres, with 20-acre mill site and 320 acres coal land, in the Pioneer district, Dolores county, includes the Group and Syndicate mines. Ore occurs in fissure veins as lime replacements. Veins are reported to vary from a few inches to 15' in width, traceable a mile long and to be proven to a depth of 700'. In one mine the ores carry 4% copper,

10% lead, 10% zinc and 10 oz. silver, the copper ore occurring as chalcopryrite associated with pyrite, sphalerite and galena in fluoritic gangue.

**Development:** by tunnels, 1,000 to 3,000' long. A crosscut tunnel was planned, 1919, to run through the group and to cut 3 veins. Equipped with 125 hydro-electric power at mine and 100-h. p. at mill. There are two 75-h. p. hoists, 2 compound air compressors, 10 air drills and 1 air electric drill; two 9 by 15" Blake crushers, 18 Wilfley tables, etc.

**Production:** up to 1918 estimated at 1,200,000 lb. copper. Operated and produced during 1919. No figures available.

#### TALISMAN MINE

COLORADO

Address: George Stahl, care Vindicator Consolidated G. M. Co., Independence, Teller county, Colo.

Property: about 5,000 acres directly N. of the main mineralized belt of Cripple Creek. Acting on the theory of W. H. Trask of Denver, in which he argues that below the granite overburden are valuable orebodies, diamond drilling is under way. By January 1921, the first hole on the Wild ranch was 1,357' deep, at 1,290' the drill entered 'dike' formation, showing fluorite, with a trace of gold. No 2 hole on the Talisman claim was 400' deep early in 1921; at 390' a phonolite dike, 7' wide, was cut; is to be sunk to 800'.

#### TAMASOA MINE

COLORADO

Address: Cicero Barber, Idaho Springs, Colo.

Property: at Idaho Springs, Clear Creek county, contains gold-silver-lead bearing ore. Operated during part of 1920.

#### TARBOX TUNNEL MINE

COLORADO

Address: J. L. Tarbox, Clayton, Ill.

Property: at Ward, Boulder county, contains gold-silver-bearing ore.

#### TAYLOR MINES CO.

COLORADO

Address: Central City, Colo.

Property: the Homer gold-silver mine, at Central City, Gilpin county. Operated during 1919 and 1920.

#### TAYLOR MOUNTAIN MINING CO.

COLORADO

Address: D. E. Cook, asst. sec., Chippewa Falls, Wis. Mine office: Garfield, Chaffee county, Colo. W. F. Norway, pres.

Inc. Oct., 1905, in Colorado. Cap. \$1,200,000; shares \$1 par. Annual meeting, in November.

Property: the Lily mine, 7 claims, 65 acres in the Monarch district, 1½ miles from Garfield and 19 miles from Salida. The property has a nearly vertical N.-S. contact vein, between granite and limestone, carrying lead and copper ores and showing copper ore which the management estimates to average 6% copper and 2 oz. silver per ton.

**Development:** by a 280' main shaft, with 4,000' of workings.

**Equipment:** includes electric power with 16-h. p. hoist and 35-h. p. air compressor. Shipments made in 1918.

#### TEK MINING, MILLING & LEASING CO.

COLORADO

Presumably defunct. See Volume XIV.

#### TELESCOPE MOUNTAIN MINING CO.

COLORADO

Address: 32 Midland Block, Colorado Springs, Colo.

Property: the Telescope mine at Chattanooga, San Juan county. Operations started in fall of 1917, but owing to internal difficulties among the stockholders and officials, mine was closed until April, 1918. The Maude vein on property said to show ore that assays 50% lead, 8-10 oz. silver, with small gold values. Development continued during 1919.

**Equipment:** includes compressor and power.

#### TENDERFOOT HILL CONS. MNG. CO. COLORADO-SO. DAKOTA

Office: 317 Exchange Nat'l. Bank Bldg., Colorado Springs, Colo.

Officers: W. A. Otis, pres.; L. L. Aitken, v. p.; A. D. Aitken, sec.; Russell H. Forbes, treas.

Cap. \$1,500,000; \$1 par; all issued. Listed on Colorado Springs Stock Exchange. No liabilities and no production. Cash in treasury, January 1, 1919, \$11,036; securities, \$3,675.

DEPARTMENT OF THE INTERIOR  
UNITED STATES GEOLOGICAL SURVEY  
GEORGE OTIS SMITH, DIRECTOR

# MINERAL RESOURCES

OF THE

# UNITED STATES

CALENDAR YEAR

1912

PART I—METALS



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1913

81C0000001005

## COSTILLA COUNTY.

*Grayback district.*—The Colorado Gold Dredging Co.'s Hammond dredge of the close connected type, of 54 buckets of 4 cubic feet capacity each, which was overturned in 1911, was not in operation in 1912. A little gold was recovered by sluicing in the district. Assessment work was done on several lode prospects.

## CUSTER COUNTY.

From 8 mines in Custer County in 1912 there were sold or treated 4,330 tons of ore, from which were recovered \$16,898 in gold; 25,426 ounces of silver, valued at \$15,637; 2,008 pounds of copper, valued at \$331; and 10,444 pounds of lead, valued at \$470, a total value of \$33,336, as compared with \$13,538 in 1911. All the metals except lead increased in value.

With the exception of several lots of lead and copper ores, the tonnage was dry or siliceous ore. The greater part of the ore was milled and the remainder was shipped to smelters.

Crude gold-silver ore was shipped to smelters from the Bassick mine, and lessees treated old tailings from the dump in a 35-ton cyanide plant. Smelting ore was shipped from the Hector and from the Whistle mine, at Rosita, and from the King of the Carbonates, Maxine Elliott, S. A. K., Troy, and Vanderbilt mines, at Westcliffe.

Some development work was done on the copper-lead-zinc sulphide ore body<sup>2</sup> of the Marion Mines & Mill Co., at Fairview, 45 miles southwest of Pueblo. The mill was idle.

## DOLORES COUNTY.

*Production of gold, silver, copper, lead, and zinc in Dolores County, Colo., 1904-1912.*

Year.	Number of producing mines.	Tonnage.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.	Average total value per ton.
		<i>Short tons.</i>		<i>Fine ounces.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>		
1904.	10	7,727	\$41,391	100,194	12,201	260,584	145,060	\$118,928	\$15.39
1905.	5	3,826	34,766	76,526	119,821	840,319	1,500,000	227,675	59.51
1906.	8	2,242	9,398	34,290	198,379	118,229	22,508	78,964	35.22
1907.	8	1,575	11,689	33,037	99,495	51,547	12,649	57,029	36.21
1908.	5	11,021	37,238	163,563	42,495	947,962	509,184	193,281	17.53
1909.	4	4,787	22,266	103,646	43,538	462,373	167,574	116,753	23.14
1910.	13	2,933	15,327	88,309	97,063	127,909	37,000	85,667	29.21
1911.	12	3,276	7,565	56,202	3,288	701,244	525,333	99,263	30.30
1912.	7	8,485	7,556	100,288	689,915	1,212,400	812,029	293,658	34.60
Increase (+) or decrease (-)	-5	+5,269	-9	+44,086	+686,627	+511,156	+286,690	+194,395	+4.30

Dolores County in 1912 produced 8,485 short tons of ore, yielding \$7,556 in gold; 100,288 ounces of silver, valued at \$61,677; 689,915 pounds of copper, valued at \$113,837; 1,212,400 pounds of lead, valued at \$54,558; and 812,029 pounds of zinc, valued at \$56,030,

<sup>1</sup> See Julian, Charles, Gold dredging in Costilla County, Colo. Min. Sci., May 25, 1911, pp. 540-542. Also, Patton, Smith, Butler, and Hoskins, Geology of the Grayback mining district, Costilla County, Colo.: Bull. Colorado State Geol. Survey for 1909, No. 2, 1910.

<sup>2</sup> See Parmelee, H. C., Zinc-ore dressing in Colorado: Metall. and Chem. Eng., Oct., 1910, pp. 566-570.

with a total value of \$293,658, as compared with \$99,263 in 1911. The gold yield remained stationary, but there were large increases in both quantity and value for the other metals.

*Lone Cone (Dunton) district.*—The Emma mine was again the only important producer in this district. The ore from this mine carries chiefly gold and silver, and the greater part was concentrated in the company's mill, the remainder being shipped to smelters. A small lot of copper ore was shipped from the Rosebud mine.

*Pioneer (Rico) district.*—This district in 1912 produced 6,819 short tons of ore, yielding \$1,316 in gold, 68,794 ounces of silver, 689,139 pounds of copper, 1,207,535 pounds of lead, and 812,029 pounds of zinc, with a total value of \$267,702, as compared with \$77,125 in 1912. The ore was lead, lead-zinc, and copper, and all was shipped from the district, the bulk of the ore going to smelters near Salt Lake City, and some to Durango, Pueblo, and Salida. Some of the ore shipped to Midvale, Utah, was concentrated by electrostatic separators and some to the Western Chemical Co., Denver, was concentrated by magnetic and wet milling. The Rico-Wellington group was the principal producing property. The public report of this company states:

That ore production consisted of lead ore, 463 tons, worth \$11,477; copper ore, 4,596 tons, worth \$79,657; zinc ore, 1,068 tons, worth \$20,389; a total value of \$111,523. \* \* \* Development covered 3,822 feet, and about 11,000 tons of lead-zinc ore is ready for mining. \* \* \* The Pro Patria mill, belonging to the Rico Mining Co., has been leased for five years; \$30,000 is being spent on remodeling the mill and power plant.<sup>a</sup>

Other producing mines were the Badger, Lillian D., Rico Argentino group, and Rico Mining Co. group.

## DOUGLAS COUNTY.

A small quantity of placer gold was recovered by sluicing in Newlins Gulch, near Parker, in Douglas County, in 1912.

## EAGLE COUNTY.

*Production of gold, silver, copper, lead, and zinc in Eagle County, Colo., 1904-1912.*

Year.	Number of producing mines.	Tonnage.	Gold. <sup>b</sup>	Silver. <sup>b</sup>	Copper.	Lead.	Zinc.	Total value.	Average value per ton.
		<i>Short tons.</i>		<i>Fine ounces.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>		
1904.	10	1,866	\$30,460	21,011	27,032	323,969	3,080	\$60,195	\$32.26
1905.	9	12,049	46,891	46,487	29,331	156,723	2,915,025	258,897	21.47
1906.	16	15,986	51,561	94,912	130,233	307,755	1,065,082	222,799	13.94
1907.	15	4,191	53,641	70,586	14,270	183,690	507,949	143,317	34.20
1908.	10	3,009	58,131	86,715	68,141	111,204	113,292	37.02	
1909.	16	11,526	53,308	125,214	286,885	152,280	740,408	202,244	17.45
1910.	13	27,761	25,231	88,313	209,551	397,409	4,147,945	341,008	12.27
1911.	11	33,177	41,160	116,109	66,608	855,880	5,007,597	440,102	13.20
1912.	19	34,164	49,294	163,735	147,176	1,240,156	5,659,261	620,571	18.16
Increase (+) or decrease (-)	+8	+987	+8,134	+47,620	+80,568	+384,267	+561,604	+180,469	+4.90

Eagle County, in 1912, produced 34,164 short tons of ore containing \$49,294 in gold; 163,735 ounces of silver, valued at \$100,697; 147,176 pounds of copper, valued at \$24,284; 1,240,156 pounds of lead, valued

<sup>a</sup> Min. & Sci. Press, Mar. 8, 1913, p. 392.

<sup>b</sup> Includes placer production.

DEPARTMENT OF THE INTERIOR  
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# MINERAL RESOURCES

OF THE

# UNITED STATES

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CALENDAR YEAR

1913

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PART I—METALS



WASHINGTON  
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1914

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lead and iron concentrates, and a small tonnage of zinc concentrates, were sent to smelters. On the south side of Clear Creek the Little Mattie mine was an important producer, with an increased tonnage both to the company's mills and to smelters. A small tonnage from the Gladstone mine was concentrated or sent to smelters. Only a small tonnage was mined from the Stanley mines. The Hoosac mine and new mill were operated for a short time. Several lots were shipped from the Almadon mine on Fall River.

In the Jackson and Cascade districts producing mines were the Black Eagle, Chicago Mountain, Dorit, Humboldt, and P. T.

*Montana (Dumont and Larson) district.*—The Montana district in 1913, from 10 mines, produced 971 tons, carrying \$1,330 in gold, 22,919 ounces of silver, 76 pounds of copper, and 175,188 pounds of lead, with a total value of \$22,893, as against \$18,754 in 1912. The principal producing mine was the Blue Ridge, the output being lead ore to smelters and dry concentrates carrying lead, silver, and some gold from the concentration plant on the property. Smelting ore was shipped from the Commodore, Millington, and Plattz mines.

*Trail Creek (Lamartine and Freeland) district.*—The Trail Creek district in 1913, from 7 mines, produced 5,845 tons, yielding \$52,201 in gold, 15,952 ounces of silver, 2,730 pounds of copper, 165,815 pounds of lead, and 56,265 pounds of zinc, with a total value of \$72,706, as against \$92,427 in 1912. Lead-zinc ore from the Ben Harrison mine was concentrated at the Newton mill, yielding lead and lead-zinc concentrates. Milling and smelting ores were shipped from the Lamartine-Money Musk group. The output of both milling and smelting ore from the Centurion-Rockford and other properties of the North American Smelter & Mines Co. decreased heavily. Ore from the Oneida mine was sent to custom mills or to smelters. The tonnage from the New Era mine was treated at its mill and crude ore shipped to smelters increased.

#### CONEJOS-RIO GRANDE COUNTIES.

*Platora-Gilmore-Summit district.*<sup>1</sup>—Prospecting and some development work was done in the reopening of this district, which is 45 miles southwest of Monte Vista, near the Rio Grande-Conejos County line. A ton test lot of ore was shipped by the Gaudaloupe Co. of Platora and 200 pounds from the Smuggler claim, near Stunner, was tested at the Woods testing plant, at Denver.

#### COSTILLA COUNTY.

*Grayback district.*<sup>2</sup>—A small quantity of gold was recovered by sluicing in the district.

#### CUSTER COUNTY.<sup>3</sup>

From 7 mines in Custer County in 1913 there were sold or treated 4,662 tons of ore, from which were recovered \$14,648 in gold, 11,313

<sup>1</sup> For discussion of the geology of the district see Hills, R. C., Ore deposits of the Summit district, Rio Grande County, Colo.: Colorado Sci. Soc. Proc., vol. 1, pp. 20-36, 1883. Raymond, R. W., Mines and mining west of the Rocky Mountains, vol. 10, p. 329, 1875. Emmons, W. H., The enrichment of sulphide ores: U. S. Geol. Survey Bull. No. 529, p. 226, 1913.

<sup>2</sup> For discussion of geology see Patton, Smith, Butler, and Hoskins, Geology of the Grayback mining district, Costilla County, Colo.: Colorado State Geol. Survey Bull. for 1909, No. 2, 1910.

<sup>3</sup> For discussion of geology see Cross, Whitman, Geology of Silver Cliff and the Rosita Hills, Colorado: U. S. Geol. Survey Seventeenth Ann. Rept., pt. 2, pp. 263-403, 1896, and Emmons, S. F., The mines of Custer County: Idem, pp. 405-472.

ounces of silver, valued at \$6,833; 4,052 pounds of copper, valued at \$628; and 5,273 pounds of lead, valued at \$232, with a total value of \$22,377, as compared with \$33,336 in 1912. The yield of all the metals except copper decreased. The greater part of the ore was treated by cyanidation and the remainder was shipped to smelters.

Dump ore from the Bassick mine was treated in the 35-ton cyanide plant at Ilse. Smelting ore was shipped from the Bismuth, Delaware, Delia, King of the Carbonates, and Twenty-Six mines at Westcliffe.

The Terrible mine<sup>1</sup> near Ilse, was unwatered during 1913, but no output was made.

#### DOLORES COUNTY.

*Production of gold, silver, copper, lead, and zinc in Dolores County, Colo., 1904-1913.*

Year.	Number of producing mines.	Tonnage.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.	Average total value per ton.
		Short tons.		Fine ounces.	Pounds.	Pounds.	Pounds.		
1904.....	10	7,727	\$41,391	100,184	12,201	250,584	145,060	\$118,928	\$15.39
1905.....	5	3,826	\$4,760	70,525	119,521	840,319	1,500,000	227,675	59.61
1906.....	2	2,242	1,398	34,290	199,379	118,229	22,506	78,904	35.22
1907.....	8	1,575	11,689	33,037	99,495	54,547	12,649	67,029	30.21
1908.....	5	11,024	37,238	163,563	42,495	947,962	509,184	193,281	17.53
1909.....	10	4,787	22,266	103,646	43,538	462,373	167,574	110,753	23.14
1910.....	13	2,933	15,327	88,309	97,063	127,909	87,000	85,667	29.21
1911.....	12	3,276	7,565	56,202	3,288	701,244	525,333	96,263	30.30
1912.....	7	8,485	7,556	100,288	689,915	1,212,400	812,029	293,658	34.60
1913.....	8	17,802	12,432	178,816	801,819	3,079,341	2,596,232	525,599	29.52
Increase (+) or decrease (-).....	+1	+9,317	+4,876	+78,528	+111,904	+1,866,941	+1,784,203	+231,941	-5.08

Dolores County in 1913 produced 17,802 short tons of ore, yielding \$12,432 in gold; silver, valued at \$108,005; copper, at \$124,282; lead, at \$135,491; and zinc, at \$145,389, with a total value of \$525,599, as compared with \$293,658 in 1912.

*Lone Cone (Dunton) district.*—The Emma mine continued to be the only important producer in the Lone Cone district. The ore from this mine carries chiefly gold and silver; the greater part was concentrated in the company's mill, the remainder being shipped to smelters. A small tonnage of ore carrying silver and copper was shipped from the Rosebud mine and from the Liberty Trust mine.

*Pioneer (Rico)<sup>2</sup> district.*—This district in 1913 produced 17,272 tons, yielding \$6,332 in gold, 153,111 ounces of silver, 800,375 pounds of copper, 3,075,745 pounds of lead, and 2,596,232 pounds of zinc, with a total value of \$503,591, as compared with \$267,702 in 1912. The ore was lead, lead-zinc, copper, and iron; part of the lead-zinc ore was concentrated at Rico, and part was shipped to Coffeyville, Kans.; the lead and copper ore went to smelters near Salt Lake City, and some to Durango, Pueblo, and Salida; and the iron ore was shipped to Vanadium, for use in the treatment of vanadium

<sup>1</sup> For discussion of geology see Hunter, J. F., Some cerussite deposits in Custer County, Colo.: U. S. Geol. Survey Bull. 580, pp. 25-37, 1911.

<sup>2</sup> For discussion of geology see Ransome, F. L., The ore deposits of the Rico Mountains, Colorado, U. S. Geol. Survey, Twenty-second Ann. Rept., pt. 2, pp. 229-398, 1901.

ores. The Rico-Wellington group was the principal producing property. The public report of this company states:

The remodeling of the Pro Patria mill, on which we have a five-year lease, and started during 1912, was completed during the early part of 1913 \* \* \* 5,178 tons of lead-zinc ore have been milled \* \* \*. We have made into concentrate and middlings (including 270 tons of middlings) over 92 per cent of the product sent to the mill. Ore production, lead ore, 786 dry tons, \$19.09 per ton; copper ore, 4,804 dry tons, \$9.73 per ton; lead concentrates, \$36.20 per ton; zinc concentrates, \$13.22 per ton; zinc middlings, \$8.88 per ton.

Lessees (including the Rico Argentine Co.) on the Rico Mining Co.'s group also produced a large tonnage of ore of various classes. Some iron ore was shipped to Vanadium, Colo., for use in the treatment of vanadium ores.<sup>1</sup> Other producing mines were the Sambo, David M., South Park, and Lucky Boy.

#### DOUGLAS COUNTY.

A small quantity of placer gold was recovered by sluicing in Newlins Gulch, near Parker, in Douglas County, in 1913.

#### EAGLE COUNTY.

Production of gold, silver, copper, lead, and zinc in Eagle County, Colo., 1904-1913.

Year.	Number of producing mines.	Tonnage.	Gold. <sup>a</sup>	Silver. <sup>a</sup>	Copper.	Lead.	Zinc.	Total value.	Average value per ton.
		Short tons.		Fine ounces.	Pounds.	Pounds.	Pounds.		
1904.....	10	1,896	\$30,460	21,011	27,042	323,069	3,080	\$60,195	\$32.26
1905.....	9	12,019	46,891	46,487	29,331	158,723	2,915,025	258,897	21.47
1906.....	16	15,980	51,561	91,912	130,233	307,755	1,065,082	222,799	13.94
1907.....	15	4,191	53,641	70,586	14,270	193,690	507,949	143,317	14.20
1908.....	10	3,009	58,131	86,715	66,141	11,304	.....	113,292	37.62
1909.....	16	11,526	53,308	125,214	286,885	152,280	740,408	202,244	17.45
1910.....	13	27,761	25,231	88,313	209,551	397,409	4,147,945	341,008	12.27
1911.....	11	33,177	41,160	116,109	66,608	855,889	5,097,597	440,102	13.26
1912.....	19	31,164	49,294	163,735	147,170	1,210,156	5,659,261	620,571	18.16
1913.....	29	47,488	41,230	301,380	41,368	1,351,205	0,683,613	663,403	13.97
Increase (+) or decrease (-).....	+10	+13,321	-8,071	+137,645	-107,808	+111,049	+1,024,382	+42,832	-5.19

<sup>a</sup> Includes placer production.

Eagle County in 1913 produced 47,488 tons of ore, yielding \$41,220 in gold; silver, valued at \$182,034; copper, at \$6,412; lead, at \$59,453; zinc, at \$374,284—a total value of \$663,403, as compared with \$620,571 in 1912. The yield of silver for the county increased 137,645 ounces, owing to the output of the new silver district at Eagle; the yield of zinc increased 1,024,382 pounds. The county maintained its place as third in the production of zinc, almost equaling Summit County's zinc yield. There were 29 producing deep mines, as against 19 producing mines, 1 of which was placer, in 1912. Both the tonnage shipped to separating mills and to smelters increased.

*Battle Mountain district.*—With an increase in the capacity of the magnetic separation mill from 80 tons to 120 tons per day in 1912, an increased tonnage of lead-zinc sulphide ore was mined and milled

in 1913 from the Iron Mask group. The output was zinc, lead, and iron concentrates. The crude ore milled carries about as follows: 1 to 5 per cent lead, 17 per cent zinc, 30 per cent iron, 26 per cent sulphur, and 2 per cent silica.<sup>a</sup> Some lead oxidized ore was also shipped in 1913. Lessees on the Champion and Ground Hog mines shipped dry gold-silver sulphide, lead sulphide, and copper sulphide ores. Lead sulphide ore, dry silver ore, and lead-zinc sulphide ore were shipped from the Wilkesbarre mine by lessees. Other mines of importance from which ore was shipped were the Bleak House, Foster Combination, and Alleghany mines, Pine Martin, Star of the West, and Tip Top.

*Eagle or Brush Creek district.*—From this new district, on Brush Creek, a considerable tonnage of silver ore was shipped to smelters from the Lady Belle and North Dakota mines.

*Girard Mountain district.*—A small tonnage of copper ore was shipped from the Black Tiger and from the California mine.

*Holy Cross district.*—Small lots of gold-silver ore of good grade were shipped from the Alaska, Gold Bug, and Spread Eagle mines.

*Mount Egle district.*—A small tonnage of gold-silver ore of good grade was shipped from the Ohio mine.

#### EL PASO COUNTY.

*Blair Athol district.*—From a surface deposit of copper oxidized ore in sandstone at Blair Athol, about 6 miles north of Colorado City, several cars of ore and concentrates (made with the Hardwick hydraulic concentrator) were shipped.

#### FREMONT COUNTY.

A small tonnage of lead-zinc ore from the Gumaer mine at Cotopaxi was shipped to Denver, and of copper ore from the Farrell mine at Parkdale was shipped to Omaha.

#### GARFIELD COUNTY.

A small tonnage of gold-silver ore, carrying a good commercial content of gold, was shipped from the Gray Eagle mine, near Newcastle.

#### GILPIN COUNTY.

Production of gold, silver, copper, lead, and zinc in Gilpin County, Colo., 1904-1913.

Year.	Number of producing mines.	Tonnage.	Gold. <sup>b</sup>	Silver. <sup>b</sup>	Copper.	Lead.	Zinc.	Total value.	Average value per ton.
		Short tons.		Fine ounces.	Pounds.	Pounds.	Pounds.		
1904.....	55	109,557	\$1,104,833	335,354	604,791	125,731	113,000	\$1,395,023	\$12.73
1905.....	66	182,873	1,450,033	340,991	612,770	619,841	191,574	1,771,589	8.69
1906.....	90	114,862	1,115,902	242,478	638,002	510,791	.....	1,430,611	12.48
1907.....	84	87,887	938,438	209,747	974,060	611,060	.....	1,283,255	14.53
1908.....	112	120,761	1,075,808	187,030	636,371	533,143	.....	1,281,537	10.61
1909.....	244	111,118	887,311	172,010	499,146	664,581	.....	1,070,222	9.63
1910.....	162	83,631	687,902	132,635	534,244	575,477	.....	852,695	10.19
1911.....	102	103,038	778,774	292,659	650,240	1,237,350	23,083	1,109,750	10.77
1912.....	151	118,652	901,505	316,205	1,025,770	1,331,600	25,377	1,330,796	11.22
1913.....	122	91,156	697,101	273,207	837,974	1,210,341	8,589	1,035,710	11.00
Decrease(-).....	-29	-24,406	-217,404	-42,998	-187,790	-111,259	-16,783	-295,056	-0.22

<sup>a</sup> Hanington, C. H., Colorado State Bur. Mines, Twelfth Bienn. Rept., 1911-12, p. 73, 1913.

<sup>b</sup> Includes placer production.

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<sup>1</sup> For discussion of treatment of vanadium ores see Moore, R. B., and Klithl, K. L., A preliminary report on uranium, and vanadium: Bur. Mines, Bull. 70, p. 74, 1914.

DEPARTMENT OF THE INTERIOR  
FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY  
GEORGE OTIS SMITH, Director

# MINERAL RESOURCES

OF THE

## UNITED STATES

### 1914

H. D. McCASKEY

Geologist in Charge, Division of Mineral Resources

PART I—METALS

H. D. McCASKEY, Geologist in Charge



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## DOLORES COUNTY.

Mine production of gold, silver, copper, lead, and zinc in Dolores County, Colo., in 1913 and 1914.

Year.	Number of producing mines.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.
		Short tons.	a \$12,432	Fine ounces.	Pounds.	Pounds.	Pounds.	
1913.....	8	17,802	7,973	178,816	801,819	3,079,341	2,596,212	\$525,599
1914.....	10	6,905	7,973	86,520	350,278	492,023	366,549	140,292
Increase (+) or decrease (-).	+2	-10,897	-4,459	-92,290	-451,541	-2,587,318	-2,229,663	-385,307

a Includes placer production.

Dolores County in 1914 produced 6,905 tons of ore, yielding \$7,973 in gold; silver, valued at \$47,849; copper, at \$46,587; lead, at \$19,189; and zinc, at \$18,694—a total value of \$140,292, as compared with \$525,559 in 1913.

*Lone Cone (Dunton) district.*—A small shipment of ore was made from the Emma mine.

*Pioneer (Rico) district.*—This district in 1914 produced 6,864 tons of ore, yielding \$6,542 in gold, 80,844 ounces of silver, 350,196 pounds of copper, 491,177 pounds of lead, and 366,549 pounds of zinc, with a total value of \$135,675, as compared with \$503,391 in 1913. The ore was lead, lead-zinc, copper, and iron; part of the lead-zinc ore was shipped to the Sutton, Steele & Steele plant, part to the Western Chemical Co., Denver, and part to Coffeyville, Kans.; the lead and copper ore went to smelters at Durango, Ouray, Pueblo, and Salida, Colo., and Salt Lake City, Utah; and the iron ore was sold for its iron contents alone, for use in the treatment of vanadium<sup>2</sup> ores, at Vanadium, Colo.

The Rico-Wellington group was the principal producing property. The public report of this company states:

Early in 1914 we found it necessary to discontinue shipments of copper ore until arrangements could be made with the railroad for a reduction in freight rates. This was allowed, and we started to ship on our new rate July 23, 1914, shipping two cars a day until August 12, when the smelters stopped quotations on copper and silver on account of the war. We have done 2,004 feet of work during the year, the biggest part of which is development and prospect work in new territory. We have succeeded in opening up and shipping a fair tonnage of carbonate ore from new ground and we believe from the information gained in mining this ore that we shall be able to open up still more in the future. We have also found two new beds of copper ore in new territory paralleling the old stopes, but farther away from the fissure and nearer the surface than any copper ore so far discovered. The first copper strike was made in an upraise from the main Wellington tunnel in about 850 feet from the portal and 63 feet above the tunnel level. The second strike was made in another upraise about 150 feet beyond the first raise and 93 feet above the main level. A drift was made from the top of each raise and the ore beds were found one directly above the other. \* \* \*

There is also a large percentage of the ore reserve reported in 1913 annual report still untouched, awaiting better market conditions. In addition to this we have a large tonnage (estimated at several hundred thousand tons) of almost pure iron sulphide,

<sup>1</sup> For discussion of geology see Ransome, F. L., The ore deposits of the Rico Mountains, Colorado: U. S. Geol. Survey Twenty-second Ann. Rept., pt. 2, pp. 229-398, 1901.

<sup>2</sup> For discussion of treatment of vanadium ores see Moore, R. H., and Kithill, K. L., A preliminary report on uranium and vanadium: U. S. Bur. Mines Bull. 70, p. 74, 1914.

## GOLD, SILVER, COPPER, LEAD, AND ZINC—COLORADO.

carrying about 2 per cent copper and 3 ounces of silver, which we expect to be able to treat locally as soon as the company's finances will allow us to complete tests already started and to install the necessary equipment.

Total footage development for 1914.....	Feet. 2,004
Previous footage.....	12,963

Total footage kept in repair to date..... 14,967

ORE PRODUCTION.<sup>1</sup>

Copper ore:	Short tons.
Moist weight.....	2,985.29
Moisture (4.99 per cent).....	107.31
Dry weight.....	2,777.97

Lead ore:	
Moist weight.....	2,045.39
Moisture (21.6 per cent).....	441.84

Dry weight..... 1,603.55

Iron ore:	
Moist weight (sold at flat rate per moist tons).....	656.26

Zinc concentrates:	
Moist weight.....	71.24
Moisture (5.5 per cent).....	3.92

Dry weight..... 67.32

## NET VALUES.

Copper ore.....	\$15,194.83, or \$6.6703 a ton.
Lead ore.....	12,486.04, or 7.7865 a ton.
Iron ore.....	2,547.04, or 3.8811 a ton.
Zinc concentrates.....	38.06, or .5653 a ton (royalty only).

30,265.97

Lessees (including the Rico-Argentine Co.) on the Rico Mining Co.'s group also shipped a large quantity of ore of various classes. Other producing mines were the Badger, David, Iron, Lillian D., Newman, Rico Consolidated group, and South Park.

## DOUGLAS COUNTY.

A small quantity of placer gold was recovered by sluicing in Newlins Gulch, near Parker, in Douglas County, in 1914.

## EAGLE COUNTY.

Mine production of gold, silver, copper, lead, and zinc in Eagle County, Colo., in 1913 and 1914.

Year.	Number of producing mines.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.
		Short tons.		Fine ounces.	Pounds.	Pounds.	Pounds.	
1913.....	29	47,488	\$41,220	301,380	41,368	1,351,205	6,683,613	\$663,403
1914.....	24	49,377	47,194	127,080	28,105	1,177,385	7,522,098	550,752
Increase (+) or decrease (-).....	-5	+1,889	+5,974	-171,300	-13,263	-173,820	+838,455	-112,651

<sup>1</sup> Ores sampled Jan. 1 to Dec. 31, 1914.

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# MINERAL RESOURCES OF THE UNITED STATES 1915

H. D. McCASKEY  
Geologist in Charge, Division of Mineral Resources

PART I—METALS  
H. D. McCASKEY, Geologist in Charge



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1917

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mined from the Golden Edge mine and shipped to smelters and various mills. Some ore was also shipped from the Sun and Moon group. An increased output of ore from mines in Gilpin County—the Tremont (formerly called Gunnell), Pozo-Dyke, and Kansas mines—was trammed through the Argo tunnel and sold or treated at Idaho Springs. The output and the recovered metals from this ore are credited to Gilpin County. At the mouth of the Argo tunnel, the Argo 20-stamp cyanidation and concentration mill was operated steadily. Experimentation in the use of the froth flotation process begun in 1915 at this mill resulted in the complete abandonment of the cyanide process and the installation of the flotation process in June, 1916. Ore from the Franklin mine, in Gilson Gulch, was shipped to the sampler. A small quantity of ore from the Idaho-Bride mine (worked through the Idaho tunnel) was milled at the reconstructed Mixsell mill. On the south of Clear Creek, the Little Mattie mine continued to be an important producer of ore which was sent to smelters and to its own amalgamation and concentration mill. A small output of smelting ore was made from the Gladstone mine. Several small lots of ore from the Quito mine were concentrated. Lessees on the Stanley mine shipped a small quantity of ore to the sampler or to custom mills. A small production was made from the Lincoln mine. Several lots of silver-lead ore were shipped from the Almaden mine, on Fall River.

A small production was made from the Humboldt mine, in the Cascade district.

The mills operated at Idaho Springs in 1915 were the Argo, Combination, Hudson, Jackson, Payne (Mixsell), and Newton.

*Montana (Lawson and Dumont) district.*—The Montana district in 1915, from 10 mines, produced 283 tons of ore, carrying \$3,925 in gold, 2,834 ounces of silver, 9,274 pounds of copper, and 11,896 pounds of lead, with a total value of \$7,544, as against \$11,209 in 1914. All but a small quantity of ore went to smelters. Producing mines were the Albion, Avalanche, Heliotrope, Platts, Princess, Senator, Skidoo, Silver Treasure, and Syndicate.

*Trail Creek (Lamartine and Freeland) district.*—The Trail Creek district in 1915, from 7 mines, produced 20,594 tons of ore, yielding \$50,300 in gold, 19,548 ounces of silver, 11,520 pounds of copper, and 107,383 pounds of lead, with a total value of \$67,274 as against \$47,411 in 1914.

The Oneida 50-ton concentration and cyanide mill, placed in operation in December, 1914, was operated as a cyanidation mill for only two months when froth-flotation superseded cyanidation. It was then operated continuously throughout the year. The New Era 25-ton concentration plant was operated from March until November. Lessees operating the Lamartine mine shipped ore to the sam-

## GOLD, SILVER, COPPER, LEAD, AND ZINC—COLORADO.

pler at Idaho Springs and to the 50-ton concentration plant on the property. Several shipments of gold-silver ore were made from the United Freeland mine, and small shipments were also made from the Donaldson and Gum Tree mines.

### CONEJOS AND RIO GRANDE COUNTIES

*Platoro-Gilmore-Summitville district.*—In the Summitville district, Rio Grande County, an important production of gold-silver bullion was derived from operations on the Bonanza mine, and a small shipment of gold ore was made from the Belmont mine. No work was done on the property of the Guadalupe Mining Co. at Jasper.

In Conejos County development work was done at the property of the Smuggler-Sunbeam Co.

### COSTILLA COUNTY.

*Grayback district.*<sup>2</sup>—No production was made in this district in 1915.

### CUSTER COUNTY.<sup>3</sup>

From 23 mines in Custer County in 1915 there were sold or treated 1,719 tons of ore, from which were recovered \$4,098 in gold; 31,633 ounces of silver, valued at \$16,038; 12,640 pounds of copper, valued at \$2,212; 89,808 pounds of lead, valued at \$4,221; and 30,411 pounds of zinc, valued at \$3,771; a total value of \$30,340, as compared with \$13,268 in 1914. There were increases in all the metals, that of silver being the largest. The greater part of the ore from this county was shipped to smelters.

At Ilse dump ore from the Bassick mine was treated in the 35-ton cyanide plant. Small shipments of ore to smelters were made from the Bassick, Miners Delight, and Terrible<sup>4</sup> mines. At Silver Cliff smelting ore was shipped from the Augustin, Bull Domingo, Clarita, Herman, King of the Carbonates, Last Chance, Nodoway, Passiflora, Pioneer, Precipitate, Quartz King, Twenty-Six, Van Emmet, and White mines.

### DOLORES COUNTY.

*Mine production in Dolores County, Colo., in 1914 and 1915.*

Year.	Number of producing mines.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.
		Short tons.		Fine oz.	Pounds.	Pounds.	Pounds.	
1914.....	10	6,905	\$7,973	86,526	350,278	492,023	366,549	\$140,202
1915.....	10	14,192	11,032	127,933	1,032,480	268,447	35,936	274,551
Increase or decrease, 1915.....		+7,287	+3,059	+41,407	+682,202	-223,576	-330,613	+134,259

<sup>1</sup> For description of the geology of the district see Hills, R. C., Ore deposits of the Summit district, Rio Grande County, Colo.: Colorado Sci. Soc. Proc., vol. 1, pp. 20-30, 1883. Raymond, R. W., Mines and mining west of the Rocky Mountains, vol. 10, p. 329, 1875. Emmons, W. H., The enrichment of sulphide ores: U. S. Geol. Survey Bull. 520, p. 226, 1913.

<sup>2</sup> For discussion of geology see Patton, Smith, Butler, and Hoskins, Geology of the Grayback mining district, Costilla County, Colo.: Colorado State Geol. Survey Bull. for 1909, No. 2, 1910.

<sup>3</sup> For discussion of geology see Cross, Whitman, Geology of Silver Cliff and the Rosita Hills, Colo.: U. S. Geol. Survey Seventeenth Ann. Rept., pt. 2, pp. 263-403, 1890, and Emmons, S. F., The mines of Custer County: Idem, pp. 405-472.

<sup>4</sup> For discussion of geology see Hunter, J. F., Some cerussite deposits in Custer County, Colo.: Bull. 580, pp. 26-37, 1914.

<sup>1</sup> For description see U. S. Geol. Survey Mineral Resources, 1912, pt. 1, p. 653, 1913; Eng. and Min. Jour., Aug. 30, 1913, pp. 385-389; and Colorado State Bur. Mines Twelfth Bienn. Rept., 1911-12, p. 80, 1913.

See also Roller, A. H., and Curran, H. T., Ore treatment at the Argo mill: Eng. and Min. Jour., p. 1, July 4, 1914.

Eng. and Min. Jour., Aug. 1, 1914, p. 217.

Pearce, J. A., Cyanidation of Clear Creek and Gilpin County sulphides: Min. and Sci. Press, Nov. 28, 1914, pp. 833-837.

Helzer, O. F., Colorado State Bur. Mines Thirteenth Bienn. Rept., 1913-14, pp. 87-90, 1914.

Parmelee, H. C., Cyanidation of low-grade sulphide ores in Colorado: Met. and Chem. Eng., July, 1915, pp. 421-425.

Pearce, J. A., Flotation versus cyanidation: Met. and Chem. Eng., July 15, 1916 pp. 706-708; Flotation tribulations: Min. and Sci. Press, Sept. 10, 1916, pp. 427-430.

RIC000001048

Lake County (Leadville and outlying districts) produced gold, silver, copper, lead, and zinc having a total gross value of \$13,839,401, the largest since 1883, and an increase for the year of \$4,782,104. The Arkansas Valley lead smelter, to which many improvements had been made, was operated steadily. The zinc-oxide plant, unsuccessful in 1914, was actively operated on zinc carbonate ores of 16 per cent or less. The Pingrey concentration-flotation plant was also operated steadily and the Empire Zinc Co.'s concentration magnetic-separation mill at Canon City was operated with increased capacity on Leadville zinc sulphide ores, as was the Western Chemical Co.'s wet concentration magnetic-separation plant at Denver. The unwatering of the Downtown districts by electric pumps reached a depth of 700 feet at the Penrose shaft, and a consolidation of Fryer Hill claims led later to the installation of electric pumps at the Harvard shaft. Considerable interest was shown in the development work centering on Prospect Mountain, an increased output was made from the Dolly B.-Polaris-Vega mines at the heading of the Yak tunnel, and a small output was made from Iowa Gulch mines. A dredge installed on Arkansas River, below Malta, produced \$69,009 in placer gold in 70 days, the yardage handled averaging 47½ cents. The Lackawanna Gulch district continued to ship bullion and high-grade gold ore and concentrates, and silver ore in quantity continued to be shipped from the Sugar Loaf district. Zinc carbonate ore was mined and shipped from Weston Pass.

Eagle County's output came chiefly from Red Cliff, but included also a considerable quantity of silver from the Brush Creek district. The value of the output for 1915 was the largest since the discovery of ore at Red Cliff in 1879 and exceeded that of 1914 by more than \$1,000,000. The value of the zinc alone was \$1,381,577.

Summit County dredges and placers produced gold almost equal to the output in 1914, and the production of zinc in quantity and particularly in value greatly exceeded any previous record.

Park County's output of placer gold decreased greatly, but its output of gold and zinc from deep mines increased.

The Pitkin County (Aspen) output showed an increase in silver but a decrease in lead.

Gunnison County's output showed an important increase in gold and a large increase in zinc.

Chaffee County's output showed small changes in gold, silver, copper, and lead but a heavily increased output of zinc.

Fremont County continued to produce an appreciable quantity of copper and materially increased its output of zinc. There were increases for all metals from Custer County, but Saguache County mines were not so active as in 1914. Operations at Summitville, Rio Grande County, produced considerable gold.

The San Juan region of Dolores, La Plata, Ouray, San Juan, and San Miguel counties produced \$3,854,521 in gold, 2,278,201 ounces of silver, 3,517,462 pounds of copper, 14,314,363 pounds of lead, and 3,342,565 pounds of zinc, with a total value of \$6,712,378, as compared with \$3,969,857 in gold, 2,515,437 ounces of silver, 2,379,639 pounds of copper, 11,861,766 pounds of lead, and 1,382,334 pounds of zinc, with a total value of \$6,210,494, in 1914.

Mineral County (Creede) showed a heavy decrease in silver, which was not equalized in value by the increase in gold and lead.

Boulder, Gilpin, and Clear Creek counties produced 214,823 tons of ore, yielding \$1,249,894 in gold, 790,065 ounces of silver, 1,094,011 pounds of copper, 4,008,744 pounds of lead, and 1,516,032 pounds of zinc, with a total value of \$2,218,308, as compared with 168,796 tons of ore, yielding \$1,167,538 in gold, 802,481 ounces of silver, 1,118,688 pounds of copper, 3,459,231 pounds of lead, and 1,080,294 pounds of zinc, with a total value of \$1,950,299, in 1914. Boulder County output showed increase in all metals except silver; Clear Creek showed increase in all metals; Gilpin County showed small decreases in all metals except lead.

Mine production of metals in Colorado in 1915.

County.	Producing mines.	Ore sold or treated.	Gold.		Silver.	
			Quantity.	Value.	Quantity.	Value.
			Short tons.	Fine ounces.	Fine ounces.	
Baca.....	113	30,778	7,760.95	\$160,433	271,292	137
Boulder.....	15	68,240	15,293.56	316,146	226,996	115
Chaffee.....	102	121,993	25,473.46	528,583	393,108	199
Clear Creek.....	23	1,719	198.24	4,098	31,633	16
Custer.....	10	14,192	577.21	11,932	127,933	64
Dolores.....	3		28.83	596	4	
Douglas.....	25	74,197	4,616.24	95,426	177,550	90
Eagle.....	4	1,600	32.61	674	3,168	1
Fremont.....	1	123	256.82	5,309	112	
Garfield.....	90	54,052	27,229.22	562,578	125,665	6
Gilpin.....	1		7.40	153	2	
Grand.....	16	6,446	2,912.03	60,197	24,892	1
Gunnison.....	11	488	35.65	737	9,621	
Hinsdale.....	101	481,620	108,657.60	2,246,152	2,571,002	1,30
Lake.....	25	2,952	3,460.26	71,530	46,369	2
La Plata.....	9	28,071	1,598.26	33,039	291,807	14
Mineral.....	4		126.40	2,613	6	
Moffat.....	1	14	23.90	494	103	
Montezuma.....	6	169	61.78	1,277	1,073	
Montrose.....	38	103,258	54,094.02	1,118,016	576,621	2
Ouray.....	17	2,620	7,108.02	159,339	9,227	
Park.....	13	108,579	1.40	29	448,915	2
Pitkin.....	3	1,500	724.08	14,968	325	
Rio Grande.....	2		17.95	371	11,266	
Routt.....	10	692	255.08	5,273	430,637	2
Saguache.....	42	147,878	28,235.57	583,681	1,096,641	5
San Juan.....	25	483,954	100,105.39	2,069,362	61,223	
San Miguel.....	41	44,602	32,901.07	680,144	87,767	
Summit.....	70	948,082	661,939.02	13,693,494		
Teller.....						
Total, 1915.....	821	2,737,020	1,084,322.92	22,414,944	7,027,972	3.4
Total, 1914.....	866	2,677,526	961,845.20	19,883,105	8,706,065	4.1
Increase or decrease.....	-45	+59,494	+122,477.72	+2,531,839	-1,788,093	-1.

RIC000001047



DEPARTMENT OF THE INTERIOR

FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, Director

# MINERAL RESOURCES

OF THE

# UNITED STATES

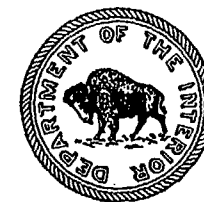
## 1916

H. D. McCASKEY

Geologist in Charge, Division of Mineral Resources

### PART I—METALS

H. D. McCASKEY, Geologist in Charge



WASHINGTON

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1919

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ounces of silver, valued at \$24,327; 44,004 pounds of copper, valued at \$10,825; 123,536 pounds of lead, valued at \$8,524; and 10,970 pounds of zinc, valued at \$1,470; a total value of \$51,455, as compared with \$30,340 in 1915. There were increases in all the metals except zinc. With the exception of a nominal quantity of gold-silver bullion from the Bassick mine, all the production from this county was contained in ores shipped direct to smelters.

An appreciable quantity of gold-silver ore was shipped from the dump of the Bassick mine, in the Rosita Hill district. The Terrible<sup>1</sup> mine was idle. A small shipment of lead ore was made from the Marion mine, at Fairview. Producing mines at West Cliff were the Bismuth, Herman, Lady Franklin, Last Quarter, Passiflora, Pioneer, and Ten To One.

#### DOLORES COUNTY.

*Mine production in Dolores County, Colo., in 1915 and 1916.*

Year.	Number of producing mines.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.
		<i>Short tons.</i>		<i>Fine ounces.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	
1915.....	10	14,192	\$11,932	127,933	1,032,480	268,447	35,936	\$274,551
1916.....	13	6,398	7,426	77,280	419,500	588,333	182,306	226,497
Increase or decrease, 1916.....	+3	-7,794	-4,506	-50,653	-612,980	+319,880	+146,370	-48,054

*Lone Cone (Dunton) district.*—A small shipment of ore was made from the Emma mine.

*Pioneer (Rico) district.*<sup>2</sup>—This district in 1916 produced 6,370 tons of ore, yielding \$5,557 in gold, 71,578 ounces of silver, 419,500 pounds of copper, 587,695 pounds of lead, and 182,306 pounds of zinc, with a total value of \$220,832, as compared with \$271,454 in 1915. The larger part of the ore shipped from this district in 1916 was copper ore, which was sent to smelters in Utah and also to Durango, Colo. There was an increased quantity of lead-zinc ore shipped, and also of zinc ore. Some iron ore (for its iron content only) was shipped to Vanadium, Colo., for use in the treatment of vanadium ores.<sup>3</sup>

The Rico Wellington group was the principal producing property. The public report of this company states that the output for 1916 was 4,989 tons of copper and lead ore, with a net value of \$19.09 a ton; and 292 tons of iron sulphide ore, with a net value of \$4 a ton. The total net value from all production was \$102,202. There was 7,062 feet of development work done.

Lessees on the Rico Mining Co.'s group also shipped a considerable quantity of lead and lead-zinc sulphide ore. Lead sulphide ore was

<sup>1</sup> For discussion of geology see Hunter, J. F., Some cerussite deposits in Custer County, Colo.: U. S. Geol. Survey Bull. 580, pp. 25-37, 1914.

<sup>2</sup> For discussion of geology see Cross, Whitman, and Spencer, A. C., Geology of the Rico Mountains, Colo.: U. S. Geol. Survey Twenty-first Ann. Rept., pt. 2, pp. 7-165, 1900; and Ransome, F. L., The ore deposits of the Rico Mountains, Colo.: U. S. Geol. Survey Twenty-second Ann. Rept., pt. 2, pp. 229-308, 1901.

<sup>3</sup> For discussion of treatment of vanadium ores see Moore, R. B., and Kithill, K. L., A preliminary report on uranium and vanadium: U. S. Bur. Mines Bull. 70, p. 74, 1914.

shipped from the Lucky Boy group by the Rico Consolidated Mining Co. Other producing mines were the Argentine, Aztec, Carbon, Forest Payroll, Iron Cap, and Nora Lilly.

#### DOUGLAS COUNTY.

There seems to have been no placer gold recovered by sluicing in Newlins Gulch, near Parker, and other localities of Cherry Creek in Douglas County, from which for many years there has been a nominal quantity produced each year.

#### EAGLE COUNTY.

*Mine production in Eagle County, Colo., in 1915 and 1916.*

Year.	Number of producing mines.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.
		<i>Short tons.</i>		<i>Fine oz.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	
1915.....	25	74,197	\$95,426	177,550	60,086	1,391,043	11,141,750	\$1,643,056
1916.....	32	105,119	96,036	222,126	112,610	1,517,362	28,438,052	4,185,294
Increase, 1916.....	+7	+30,952	+610	+44,576	+52,524	+123,319	+17,296,302	+2,542,238

a Includes small placer production.

The total value of the output of Eagle County in 1915 was by far the largest since the discovery of gold at Red Cliff in 1879, but the total value was two and one-half times as great in 1916 as in 1915. The greater part of the production of Eagle County came from the Battle Mountain (Red Cliff) district, although there was a considerably increased yield of silver from the Brush Creek district, also several small lots of ore from the Edwards district and one small lot of copper ore from the Fulford district. The value of the output of zinc for 1916 was \$3,810,699, an increase of \$2,429,122. The county continued to maintain second place to Lake County in the yield of zinc.

*Battle Mountain (Red Cliff)<sup>1</sup> district.*—The Red Cliff district in 1916 produced 103,799 tons of ore, yielding \$95,378 in gold, 113,120 ounces of silver, 110,732 pounds of copper, 1,515,580 pounds of lead, and 28,438,052 pounds of zinc, the total value being \$4,112,325, as compared with \$1,630,781 in 1915. The Iron Mask mill was continuously operated on lead-zinc ore from the Iron Mask mine, with product in zinc, lead, and iron manganese concentrates. In addition, a considerable quantity of zinc carbonate ore was shipped from the Iron Mask mine and smaller quantities of zinc carbonate ore from other properties in the district. A very large quantity of zinc-lead sulphide ores was shipped from the Black Iron and Ground Hog mines to various mills and smelters. Other producing mines of importance were the Ben Butler, Foster-Combination, Mabel, Pursey Chester, Star of the West, Tip-Top, Tram, and Wyoming Valley.

<sup>1</sup> For discussion of geology see Means, A. H., Geology and ore deposits of Red Cliff, Colo.: Econ. Geology, vol. 10, No. 1, pp. 1-27, January, 1915; also Argall, Philip, Siderite and sulphides in Leadville ore deposits: Min. and Sci. Press, July 11, 1914, p. 62 (siderite at Red Cliff.)

DEPARTMENT OF THE INTERIOR  
JOHN BARTON PAYNE, Secretary

UNITED STATES GEOLOGICAL SURVEY  
GEORGE OTIS SMITH, Director

MINERAL RESOURCES  
OF THE  
UNITED STATES  
1917

H. D. McCASKEY  
Geologist in Charge, Division of Mineral Resources

PART I—METALS  
H. D. McCASKEY, Geologist in Charge



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1921

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\$19,692 in gold, 7,352 ounces of silver, 11,916 pounds of copper, 209,396 pounds of lead, and 5,304 pounds of zinc, with a total value of \$47,552, as compared with \$76,774 in 1916.

Lessees on the Lamartine mine operated the 50-ton amalgamation-concentration mill on the property. The New Era concentration mill was also operated, yielding gold-silver-lead concentrates. Lessees shipped various classes of ore from the Freeland, Toledo, and Turner mines. Concentrating and smelting ore was shipped from the Gum Tree mine. A care of ore was shipped from the Rochford tunnel mine.

#### CONEJOS AND RIO GRANDE COUNTIES.

*Platoro-Gilmore-Summitville district.*<sup>1</sup>—A small shipment of lead ore was made by lessees from the Guadalupe mine, near Jasper, Rio Grande County. On this property there was built a small mill, mainly used for experimentation.

In Conejos County, only development work was done in the Platoro district.

#### COSTILLA COUNTY.

*Grayback district.*<sup>2</sup>—The Grayback district has been idle for several years.

#### CUSTER COUNTY.<sup>3</sup>

*Mine production in Custer County, Colo., in 1916 and 1917.*

Year.	Number of producing mines.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.
		<i>Short tons.</i>		<i>Fine ounces.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	
1916.....	14	2,245	\$6,309	36,971	44,004	123,536	10,970	\$51,455
1917.....	14	5,881	7,096	88,687	88,216	228,303	.....	123,861
Increase or decrease, 1917.....	.....	+3,636	+757	+51,716	+44,212	+104,767	-10,970	+72,406

The principal producing mine in Custer County was the Passiflora, near Silver Cliff. Most of the ore from this mine was shipped direct to smelters, the remainder being shipped as a concentrate product from experimentation in milling the ore. Other producing mines

<sup>1</sup> For discussion of the geology of the district see Hills, R. C., Ore deposits of the Summit district, Rio Grande County, Colo.: Colorado Sci. Soc. Proc., vol. 1, pp. 20-36, 1883. Raymond, R. W., Mines and mining west of the Rocky Mountains, vol. 10, p. 329, 1875. Emmons, W. H., The enrichment of sulphide ores: U. S. Geol. Survey Bull. 529, p. 226, 1913.

<sup>2</sup> For discussion of geology see Patton, Smith, Butler, and Hoskins, Geology of the Grayback mining district, Costilla County, Colo.: Colorado State Geol. Bull. for 1909. No. 2, 1910.

<sup>3</sup> For discussion of geology see Cross, Whitman, Geology of Silver Cliff and the Rosita Hills, Colo.: U. S. Geol. Survey Seventeenth Ann. Rept., pt. 2, pp. 263-403, 1896; and Emmons, S. F., The mines of Custer County: *idem*, pp. 406-472.

#### GOLD, SILVER, COPPER, LEAD, AND ZINC IN COLORADO.

were the Black Friday, Bismuth, King of the Carbonates, La. Franklin, Last Quarter, Maverick, and Quartz King.

#### DOLORES COUNTY.

*Mine production in Dolores County, Colo., in 1916 and 1917.*

Year.	Number of producing mines.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.	Total value.
		<i>Short tons.</i>		<i>Fine ounces.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	
1916.....	13	6,308	\$7,426	77,280	419,500	588,333	182,306	\$226,497
1917.....	8	14,020	6,213	86,222	519,916	1,772,221	1,701,353	645,794
Increase or decrease, 1917.....	-5	+7,628	-2,213	+10,942	+100,416	+1,183,888	+1,519,047	+319,297

*Lone Cone (Dunton) district.*—The Emma mine in this district was idle.

*Pioneer (Rico) district.*<sup>1</sup>—All the production from Dolores County in 1917 came from this district. The ores shipped were chiefly copper ore, zinc-lead ore, and lead ore, in order of quantity. The copper ores were shipped both to Durango, Colo., and to smelters in Utah. The zinc-lead ore was shipped to Coffeyville, Kans. Some iron sulphide ore (for its iron content only) was shipped to Vanadium, Colo., for use in the treatment of vanadium ores.<sup>2</sup>

The company and lessees on the Rico-Argentine property shipped large quantities of copper ore and also a considerable quantity of zinc-lead ore. The net smelter returns from ore shipped in 1917 from this property amounted to \$47,576 for company shipments and \$41,261 for lessees' shipments.<sup>3</sup> From the Rico-Wellington property was shipped 424 tons of copper sulphide, 1,687 tons lead-silver sulphide, 1,826 tons zinc-lead sulphide, and 709 tons pyritic ore. The net value of these shipments was \$105,589. Reserves of pyrite ore carrying 45 per cent sulphur are said to be extensive.<sup>4</sup> Other producing mines were the Duncan, Iron group, Lillian D., Lucky Boy, and Swansea-Newman.

#### DOUGLAS COUNTY.

There have been heretofore desultory attempts to recover gold by sluicing the gravels and conglomerates in Newlins Gulch, near Parker, and at other localities on Cherry Creek, in Douglas County, and nominal quantities have been recovered from time to time, but in 1917 no work was done.

<sup>1</sup> For discussion of geology see Cross, Whitman, and Spencer, A. C., Geology of the Rico Mountains, Colo.: U. S. Geol. Survey Twenty-first Ann. Rept., pt. 2, pp. 7-105, 1900; and Ransome, F. L., The ore deposits of the Rico Mountains, Colo.: U. S. Geol. Survey Twenty-second Ann. Rept., pt. 2, pp. 229-308, 1901.

<sup>2</sup> For discussion of treatment of vanadium ores see Moore, R. B., and Kithli, K. L., A preliminary report on uranium and vanadium: U. S. Bur. Mines Bull. 70, p. 74, 1914.

<sup>3</sup> See Salt Lake Min. Rev., Feb. 15, 1918, p. 39.

<sup>4</sup> Min. and Sci. Press, June 1, 1918, p. 769.



DEPARTMENT OF THE INTERIOR

ALBERT B. FALL, Secretary

UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, Director

# MINERAL RESOURCES

OF THE

## UNITED STATES

### 1920

G. F. LOUGHLIN

Geologist in Charge, Division of Mineral Resources

PART I—METALS

G. F. LOUGHLIN, Geologist in Charge



WASHINGTON

GOVERNMENT PRINTING OFFICE

1922

RIC000001074

## Content of lead-zinc ores sold or treated in Colorado in 1920.

County.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Short tons.	Fine ounces.	Fine ounces.	Pounds.	Pounds.	Pounds.
Chaffee.....	95				13,494	43,011
Clear Creek.....	7,227	66.08	35,719		1,141,341	372,420
Dolores.....	557	1.40	280	465	88,271	229,885
Gunnison.....	1,258				399,374	502,913
Lake.....	4,648	20.20	12,729		221,200	1,477,839
Pitkin.....	1,083		6,582		246,047	617,790
San Juan.....	162,570	9,991.32	509,222	1,090,049	13,534,963	11,837,395
San Miguel.....	8,000	2,065.71	71,940	18,867	461,197	175,617
Total, 1920.....	185,438	12,144.71	726,472	1,109,381	16,105,887	15,256,850
Total, 1919.....	116,120	6,717.87	283,741	483,627	5,837,856	21,079,069

## Content of zinc ores sold or treated in Colorado in 1920.

County.	Ore.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Short tons.	Fine ounces.	Fine ounces.	Pounds.	Pounds.	Pounds.
Chaffee.....	658				240,224	
Eagle.....	20,176	219.87	27,010		282,538	6,653,235
Gunnison.....	2,020				1,027,778	
Lake.....	42,977	283.15	65,897	40,004	1,277,381	17,276,682
Summit.....	30,401	51.89	5,930		146,060	8,258,328
Total, 1920.....	96,232	554.91	88,837	40,004	1,705,979	33,450,257
Total, 1919.....	50,547	80.40	28,583		857,754	16,141,424

## Gold and silver produced at mills in Colorado, 1920.

	Ore to gold and silver mills.	Gold in bullion.	Silver in bullion.	Ore to concentrating mills.
	Short tons.	Fine ounces.	Fine ounces.	Short tons.
Boulder.....		633.21	10	17,565
Clear Creek.....	404	198.27	54	46,147
Eagle.....	1,471			20,113
Gilpin.....	6,221	674.59	156	2,567
Gunnison.....				4,516
Lake.....	1,479	2,990.85	623	5,532
Ouray.....				38,533
Park.....				996
Pitkin.....			798	91,333
Saguache.....				5,430
San Juan.....	19,214	197.31	23	180,441
San Miguel.....	145,180	20,884.28	108,813	228,351
Summit.....	4,400	236.38	113	32,584
Teller.....	448,519	197,547.88	27,712	
Total, 1920.....	620,900	223,362.80	138,307	677,113
Total, 1919.....	1,195,986	340,035.56	242,269	439,373
Average content per ton 1920.....		0.3563	0.2206	

## Mine production of metals from Colorado concentrates in 1920.

County.	Concentrates.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Short tons.	Fine ounces.	Fine ounces.	Pounds.	Pounds.	Pounds.
Boulder.....	439	520.68	45,883		177,019	
Clear Creek.....	3,387	1,005.37	116,664	23,942	1,511,676	372,420
Eagle.....	15,544	254.07	27,159		282,538	6,546,554
Gilpin.....	1,002	1,281.55	9,106	11,955	220,694	
Gunnison.....	603		11,711		534,543	
Lake.....	4,196	517.90	11,101		138,243	1,154,376
Ouray.....	3,334	1,228.20	338,524	28,208	919,806	
Park.....	78	1.30	5,757	1,658	42,422	
Pitkin.....	12,602		208,317		1,655,584	
Saguache.....	545	126.66	47,697	37,082	113,843	
San Juan.....	34,734	12,378.52	638,935	1,275,165	15,937,075	11,837,395
San Miguel.....	27,649	43,867.05	927,297	938,562	7,308,219	175,617
Summit.....	11,625	232.37	13,925		201,465	8,335,963
Teller.....	3,495	10,892.60	4,260			
Total, 1920.....	119,233	72,306.27	2,406,336	2,316,572	29,043,127	28,422,325
Total, 1919.....	100,775	60,258.60	2,123,721	1,626,272	19,014,621	20,704,184

## GOLD, SILVER, COPPER, LEAD, AND ZINC IN COLORADO.

Class.	Concentrates.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Short tons.	Fine ounces.	Fine ounces.	Pounds.	Pounds.	Pounds.
Dry gold.....	6,228	15,406.53	17,199	43,377	89,799	
Dry silver.....	13,518	11,422.10	104,202	29,836	1,109,288	
Dry gold and silver.....	1,018	3,352.33	79,807		7,899	
Copper.....	20	28.80	210	1,607	236	
Lead.....	45,330	24,674.82	1,571,067	958,249	20,871,928	
Lead-copper.....	14,552	25,958.29	817,029	3,952,032		
Total to copper and lead plants.....	80,666	68,845.57	2,192,181	1,850,098	26,031,183	
Zinc.....	38,626	3,453.47	212,474	466,474	3,005,877	28,395,505
Lead-zinc.....	41	4.23	1,681	6,068		26,820
Total to zinc and lead-zinc plants.....	38,667	3,457.70	214,155	472,542	3,011,945	28,422,325
	119,233	72,306.27	2,406,336	2,316,572	29,043,127	28,422,325

a Recovered in zinc residues.

b Lead recovered in zinc residues and lead-zinc oxide.

c Zinc recovered as metal and zinc in zinc oxide.

## Average content of concentrates.

	Gold.	Silver.	Copper.	Lead.	Zinc.
	Fine ounces per ton.	Fine ounces per ton.	Per cent.	Per cent.	Per cent.
Dry gold.....	2.15	2.76	0.35	0.70	
Dry silver.....	.11	14.37	.11	4.10	
Dry gold and silver.....	3.29	75.45		3.80	
Copper.....	1.43	10.50	4.02	.59	
Lead.....	.54	34.66	1.06	23.02	
Lead-copper.....	1.78	22.86	2.81	13.58	
Total average.....	.85	27.18	1.15	16.14	
Zinc.....	.09	5.52	.61	3.90	d 46.08
Lead-zinc.....	.10	41.00		7.40	d 40.89
Total average.....	.09	5.55	.60	3.90	d 46.06

d Assay of content; no deduction for loss in smelting.

## Mine production of metals from Colorado crude ore shipped to smelters in 1920.

County.	Crude ore.	Gold.	Silver.	Copper.	Lead.	Zinc.
	Short tons.	Fine ounces.	Fine ounces.	Pounds.	Pounds.	Pounds.
Boulder.....	1,507	898.63	102,941	6,685	84,069	
Chaffee.....	3,900	1,514.24	39,211	28,195	396,250	283,235
Clear Creek.....	3,873	1,144.48	103,182	38,036	945,424	
Custer.....	1,500	38.60	34,256	28,033	171,562	
Dolores.....	2,752	113.68	32,167	6,804	772,588	229,865
Eagle.....	12,517	979.30	252,508	517,109		106,681
Gilpin.....	2,032	2,468.67	32,738	74,648	214,318	
Grand.....	3		856		423,758	
Gunnison.....	3,927	1,164.39	8,844	2,625	80,625	1,530,691
Hinsdale.....	568	297.55	21,522	2,625		
Lake.....	165,977	26,943.37	1,086,059	799,744	8,451,945	17,600,155
La Plata.....	717	533.09	10,578		837	
Mineral.....	12,597	276.22	272,322	1,120	531,537	
Ouray.....	1,662	405.76	127,053	58,673	414,769	
Park.....	4,352	6,898.52	45,263	17,016	1,043,203	
Pitkin.....	34,463		416,329		2,814,716	617,790
Routt.....	3		100			
Saguache.....	852	116.72	46,958	51,304	36,220	
San Juan.....	2,016	328.98	107,142	86,226	663,950	
San Miguel.....	629	82.10	28,557	10,134	263,656	
Summit.....	11,344	1,002.91	87,673	359	275,997	
Teller.....	90	732.92	1,817	451	612	
Total, 1920.....	267,280	45,942.16	2,857,976	1,727,162	17,586,661	20,368,417
Total, 1919.....	284,409	45,337.98	3,384,877	1,933,935	18,056,620	16,516,309

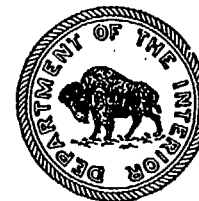
DEPARTMENT OF THE INTERIOR  
HUBERT WORK, Secretary

UNITED STATES GEOLOGICAL SURVEY  
GEORGE OTIS SMITH, Director

MINERAL RESOURCES  
OF THE  
UNITED STATES  
1921

G. F. LOUGHLIN  
Geologist in Charge, Division of Mineral Resources

PART I—METALS  
G. F. LOUGHLIN, Geologist in Charge



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1924

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## DOLORES COUNTY.

*Dunton district.*—Development work on the Emma mine during October, November, and December, resulted in the shipment of a car of silver ore of good grade. Cleaning of old workings and development work at the Rosebud mine resulted in milling some silver ore, with product of a small lot of good silver concentrates.

*Pioneer (Rico) district.*—Very little mining was done in the Rico district, owing to low prices for lead and zinc and to litigation. Several cars of silver ore were shipped from the Rico Wellington group and the Syndicate group. In the development of the copper, lead, and lead-zinc ore bodies in this district, large deposits of barren pyrite have been blocked out, but the market for pyrite has been very limited.

## DOUGLAS COUNTY.

A few ounces of placer gold were washed from gravels near Franktown.

## EAGLE COUNTY.

*Battle Mountain (Gilman, Red Cliff) district.*—Because of the low price of zinc, the large zinc deposits of the Empire Zinc Co., at Gilman, blocked out during 1919 and 1920, may be said to have been nonproducing in 1921. However, the mine was kept in operation by the shipment of large quantities of pyrite ore, carrying silver and copper, an ore particularly suitable for fluxing purposes at the Arkansas Valley, Pueblo, and Durango lead-copper smelters in Colorado, and at the Garfield and Murray plants in Utah, where the iron ores were in demand, because of a lack of such ores and an excess of siliceous ores from Utah mines. Colorado has always had considerable copper in its gold and silver ores. Gilpin County in its early years produced considerable copper used as a carrier for gold and silver in the matte produced at the Argo smelter. This, the first successful smelter in Colorado, was operated at Black Hawk from 1868 to 1878, when it was moved to Denver and operated to 1910. Brecco Hill, Carbonate Hill, and Iron Hill mines at Leadville from time to time have shipped appreciable quantities of copper ores, and the complex ores of the San Juan region generally carry some copper; but the Battle Mountain mines of Eagle County showed indications in 1921 of being among Colorado's first copper mines. With the mining of this pyritic copper-silver ore, large quantities of zinc ore which greatly exceed the pyritic ore in quantity were mined and stored in stopes and stock piles and much had to be transported to storage at Canon City for use when the Empire Zinc Co. again reopens its large modern zinc-oxide plant, completed in 1920.

Other producing mines in the Battle Mountain district in 1921 were the Alligator, Alpine, Ground Hog, Pursey Chester, Red Cap, and Star of the West. Much drifting and diamond drilling was done at the Liberty mine on Turkey Creek, with the hope of finding zinc ore bodies.

*Brush Creek district (Eagle).*—Some work was done in the Brush Creek district in driving an audit to cut under the surface workings of the Lady Belle-North Dakota group, from which several hundred thousand ounces of silver were taken in 1913-1918.

*Burns district.*—Development work was done on several prospects in the Burns district.

*Gypsum district.*—Some development work was done on a steeply dipping bedded pyrite deposit with gypsum gangue, with surface outcrop of hematite and limonite, 3 miles north of Gypsum.

*Mount Egle district (Edwards).*—Some development work was done in this district.

## EL PASO COUNTY.

At Colorado Springs the Golden Cycle 1,200-ton roast cyanide mill was operated steadily, but not at capacity, chiefly on ores from the Cripple Creek district, but also on small lots of ore from Boulder County. The Cresson mine, in the Cripple Creek district, continued to contribute a large quantity of the ore going to the Golden Cycle mill, but the Portland Co. during part of the year sent much of its better grade ores to its own Independence mill, at Victor, as well as all its low-grade mine and dump material.

## FREMONT COUNTY.

The Empire Zinc Co.'s magnetic separation plant and new zinc-oxide plant, and the Ohio zinc-oxide plant, all at Canon City, were idle in 1921, as was the River Smelting & Refining Co.'s matting and fuming plant, at Florence.

No production was made from the prospects in the Badger Creek, Cotopaxi, and Parkdale districts.

## GILPIN COUNTY.

*Southern districts (Black Hawk, Central City, Nevadaville, Russell Gulch).*—The amalgamation-concentration mills in the southern districts were not operated for any length of time in 1921. The U. P. R. (Buell) mill, overhauled in 1920, was operated for a month or two, the Polar Star mill was operated intermittently, and the Iron City mill was operated for several months. Some Gilpin County milling ores were hauled to Idaho Springs for treatment.

Within the limits of the town of Central City, the East Boston-Rialto yielded several hundred tons of ore.

In the Enterprise district, below Black Hawk, small lots of ore were shipped from the Black Jack, Button, Champion, Mascot, and Wheeler.

In the Hughesville-Hawkeye district, north of Black Hawk, the Midwest Co. unwatered the Cyclops mine, retimbered the shaft 760 feet and sunk an additional 25 feet, did 1,100 feet of drifting and stoping, completed a new 100-ton gravity-concentration and oil-flotation mill, and in the course of development shipped several hundred tons of silver ore to the Iron City concentration mill.

In the area embracing Gunnell Hill and Eureka and Prosser Gulch, the lateral from the Argo tunnel to the bottom of the concrete shaft was cleaned and retimbered and driven 50 feet westerly. A car of lead-silver ore was shipped from the Rara Avis mine.

Production in the area embracing the town of Black Hawk, and Gregory, Bobtail, and Bates hills was confined to small lots from the

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George Otis Smith, Director

MINERAL RESOURCES  
OF THE  
UNITED STATES  
1922

G. F. LOUGHLIN  
Geologist in Charge, Division of Mineral Resources

PART I—METALS  
G. F. LOUGHLIN, Geologist in Charge



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1925

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Boulder County made a small increase in production. Clear Creek and Gilpin counties both showed appreciable increases.

Mine production of gold, silver, copper, lead, and zinc in Colorado in 1922.

County.	Producing mines.	Ore sold or treated (shorttons).	Gold. <sup>a</sup>		Silver. <sup>a</sup>	
			Fine ounces.	Value.	Fine ounces.	Value.
Adams.....	1		24.09	\$198		
Boulder.....	60	3,415	1,791.06	37,037	121,073	121,073
Chaffee.....	8	6,844	964.40	19,936	26,187	26,187
Clear Creek.....	54	69,425	1,751.13	36,199	196,207	196,207
Custer.....	4	17,212	8.08	167	14,520	14,520
Dolores.....	5	678	94.48	1,953	30,267	30,267
Douglas.....	1		58	12		
Eagle.....	7	71,892	3,468.37	72,111	583,737	583,737
Fremont.....	1	7	1.02	21	174	174
Gilpin.....	43	13,707	2,501.96	51,720	43,910	43,910
Gunnison.....	9	221	444.08	9,180	3,803	3,803
Hinsdale.....	10	1,550	62.79	1,298	50,074	50,074
Lake.....	54	112,547	19,981.68	413,058	952,048	952,048
La Plata.....	16	791	1,560.63	32,261	10,656	10,656
Mineral.....	9	3,978	80.01	1,654	106,903	106,903
Moffat.....	2		5.51	114		
Montrose.....	2	251	15.58	322	17,968	17,968
Ouray.....	18	123,096	6,093.32	125,960	1,226,670	1,226,670
Park.....	11	1,120	6,875.07	142,120	15,528	15,528
Pitkin.....	16	119,023			825,169	825,169
Roitt.....	1				82	82
Saguache.....	4	9,671	234.57	4,849	63,542	63,542
San Juan.....	26	8,808	1,246.09	25,759	77,864	77,864
San Miguel.....	26	397,840	52,140.80	1,077,846	1,645,459	1,645,459
Summit.....	37	17,894	13,630.22	281,762	119,604	119,604
Teller.....	55	432,129	195,318.03	4,037,582	24,462	24,462
Total, 1921.....	480	1,412,100	308,314.15	6,373,419	5,855,911	5,855,911
	382	1,281,381	330,658.99	6,835,328	5,631,657	5,631,657
Increase or decrease, 1922.....	+98	+130,719	-22,344.84	-461,909	+224,254	+224,254

County.	Copper.		Lead.		Zinc.		Total value.
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
Adams.....							\$502
Boulder.....			68,470	\$3,766			181,876
Chaffee.....	20,526	\$2,771	661,728	36,395	178,000	\$10,146	95,435
Clear Creek.....	7,874	1,063	1,042,491	57,337	800,000	45,600	338,406
Custer.....	32,141	4,339	660,618	36,334			55,360
Dolores.....	24,089	3,252	87,200	4,796			40,268
Douglas.....							12
Eagle.....	1,330,296	179,590	322,818	17,755	11,000,000	627,000	1,480,193
Fremont.....	348	47	4,273	235			477
Gilpin.....	24,860	3,356	246,945	13,582			112,568
Gunnison.....	526	71	13,382	736			13,790
Hinsdale.....	14,269	1,926	114,200	6,281			59,579
Lake.....	871,370	117,635	5,521,818	303,700	9,003,000	513,171	2,209,612
La Plata.....							42,917
Mineral.....	3,123	462	153,455	8,440			117,459
Moffat.....							114
Montrose.....	61,119	8,251					26,541
Ouray.....	58,149	7,850	1,484,526	81,649			1,442,129
Park.....	4,215	569	155,982	8,579			166,796
Pitkin.....			3,555,309	195,542			720,711
Roitt.....							82
Saguache.....	41,622	5,619	111,782	6,148			80,158
San Juan.....	110,348	14,897	1,651,982	90,859	1,300,000	74,100	283,479
San Miguel.....	673,867	90,972	7,060,891	388,349			3,202,626
Summit.....	91,413	12,746	559,330	30,763	977,000	55,689	500,564
Teller.....							4,062,044
Total, 1921.....	3,373,454	455,416	23,477,200	1,291,246	23,258,000	1,325,706	15,301,698
	4,153,442	535,794	19,660,466	884,721	2,360,000	118,000	14,005,500
Increase or decrease, 1922.....	-779,988	-80,378	+3,816,734	+406,525	+20,898,000	+1,207,706	+1,296,198

<sup>a</sup> Includes placer production.

REVIEW BY COUNTIES.<sup>1</sup>

## ADAMS COUNTY.

A reminder and corroboration of the existence of the intermittent gravel bars carrying sufficient gold to lead the pioneer of 1858 from Denver to Golden along the bed of Clear Creek is seen in the recovery of placer gold in 1922 by a highway contractor in a washing and sluicing apparatus attached to his gravel-screening mill on the gravel bar in Clear Creek near the point where the creek crosses the Denver-Boulder-Longmont highway that goes by way of Federal Boulevard. The bullion recovered averaged 0.858 in fineness of gold and 0.136 in fineness of silver.

## BOULDER COUNTY.

*Central district.*—The Central district, near Jamestown, produced 122 tons of ore carrying \$2,803 in gold, 335 ounces of silver, and 379 pounds of lead, having a total value of \$3,159, as compared with \$4,644 in 1921. The production was the result of intermittent operations by lessees, who shipped small lots from seven properties. The largest shipments consisted of gold ore from the Earl-Niagara and Wano mines to the Golden Cycle mill, at Colorado Springs, part of which was shipped direct and part through the Boulder sampler.

*Gold Hill district.*—The Gold Hill district produced 311 tons of ore, which carried \$8,479 in gold, 5,517 ounces of silver, and 3,733 pounds of lead, having a total value of \$14,201, as compared with \$12,850 in 1921. Of the 18 producing properties the principal mines were the Emancipation, Myrtle, and Scotia, from which gold ore was shipped to the Golden Cycle mill; the Goldsmith Maid and Tippecanoe, from which siliceous silver ore and lead-silver ore were shipped to the Leadville smelter direct and through the Boulder sampler; and the Nil Desperandum and Slide, from which gold ore was shipped to Leadville through the sampler.

*Grand Island district (Cardinal, Caribou, Eldora, and Nederland).*—The Grand Island district produced 313 tons of ore, carrying \$1,914 in gold, 45,580 ounces of silver, and 17,431 pounds of lead, having a total value of \$48,453, as compared with \$46,058 in 1921. The Caribou mine, on which several sets of lessees worked continuously throughout the year and shipped high-grade silver ore in small lots, produced the bulk of the output of the district. Other producing mines were the Boulder County, Congo Chief, Grant County, Poorman, and Potosi, all shipping small lots of high-grade silver smelting ore.

*Magnolia district.*—Several small lots of ore from the Magnolia district, aggregating 28 tons, carrying \$2,383 in gold and 42 ounces of silver, were purchased by the Boulder sampler.

*Sugar Loaf district.*—The Sugar Loaf continued to be the chief producing district in Boulder County, 16 mines making an output of 1,664 tons of ore, carrying \$20,184 in gold, 62,192 ounces of silver, and 11,709 pounds of lead, with a total value of \$83,020, as compared with \$73,820 in 1921. Several sets of lessees on the Yellow Pine

<sup>1</sup> For production by counties see table, p. 530.

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George Otis Smith, Director

# MINERAL RESOURCES

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# UNITED STATES

## 1923

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F. J. KATZ  
Geologist in Charge, Division of Mineral Resources

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### PART I—METALS



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## CLEAR CREEK COUNTY

*Alice district (Yankee, Lincoln).*—Several tons of gold ore from the Champion property was treated in the Reynolds stamp amalgamation mill.

*Argentine district.*—Development work for many years resulted in 1923 in what promises to be a new mine in the Argentine district. The Gold Belt tunnel, driven into Mount McClellan from Clear Creek, 3 miles above Silver Plume, opened a vein of silver-lead and silver-lead-zinc ore, from which several hundred tons of relatively rich silver ore was shipped to the Idaho Springs sampler and direct to the Leadville smelter, and several hundred tons of lead-zinc-silver ore to the Watrous concentrating mill at Silver Plume. The products of milling were lead concentrate, dry silver concentrate, and zinc concentrate. A car of copper-gold-silver ore was shipped from the Santiago mine.

*Empire district.*—Several narrow-gauge cars of gold-silver ore from the Empress Tunnel property was concentrated at Idaho Springs. A car of sulphide gold ore was shipped to the A. V. smelter, Leadville, from the Silver Mountain mine.

*Griffith district (Georgetown, Silver Plume).*—Eleven mines in the Georgetown-Silver Plume district produced 17,446 tons of ore, yielding \$5,093 in gold, 68,923 ounces of silver, 6,061 pounds of copper, 659,743 pounds of lead, and 539,700 pounds of zinc, with a total value of \$145,383, as compared with \$209,169 in 1922. The East Butte Copper Co. continued for part of the year the milling started in 1922 of the dumps of the Diamond, Pelican, and Zero adits. The product was a lead concentrate carrying a relatively high content of silver. The Silver Plume Silver Mines Co. completed its 75-ton gravity-concentration and oil-flotation mill across Clear Creek from the Terrible mill and an aerial tram to the Mammoth mine dump, from which several hundred tons was sorted and milled with a product of zinc-silver and lead-silver concentrates. The Mendota mill was operated on lead-zinc-silver ore from the Mendota-Frostburg mine, producing lead-silver and zinc-silver concentrate. The Sunburst mill was operated for a time on dry silver ores from the Sceptre-Sunburst group. The St. George mine and gravity-concentration and oil-flotation mill were operated for a time. The Capital gravity-concentration and oil-flotation mill was operated for a short time. Several cars of lead-silver smelting ore were shipped from the Backbone mine.

*Idaho Springs district.*—In the Idaho Springs district 26 mines produced 2,535 tons of ore, carrying \$15,239 in gold, 14,422 ounces of silver, 5,021 pounds of copper, and 162,314 pounds of lead, with a total value of \$39,165, as compared with \$92,049 in 1922. The year was probably the quietest Idaho Springs has ever experienced. The Gem mines and mill, which have usually supplied the bulk of the production, were operated for a short time only. The Hudson amalgamation and concentration mill was operated for a time. Small lots of ore were mined from the Almaden, Argo (Ute Creek), Edgar, Crown Point, Gem, Golden Edge, Lincoln, Little Mattie, Queen Elizabeth, Treasures Vault, and Tropic.

*Montana district (Lawson, Dumont).*—The Montana district from 7 mines produced 764 tons of ore, yielding \$2,702 in gold, 20,745 ounces of silver, 5,558 pounds of copper, and 72,272 pounds of lead,

with a total value of \$25,589. Small lots of milling and smelting ore were shipped from the Albro, Bellevue-Hudson, Big Chance, Jo Reynolds, Mattie Jack, Millington, and Tabor tunnel.

*Trail Creek district (Lamartine, Freeland).*—The Trail Creek district produced 1,244 tons of ore, yielding \$5,916 in gold, 2,029 ounces of silver, 11,041 pounds of copper, and 35,900 pounds of lead, with a total value of \$11,716, as compared with \$3,648 in 1922. The principal producing mine was the Freeland, from which both smelting ore and milling ore were mined.

## CONEJOS COUNTY

Because of the inaccessibility of the ore deposits of Conejos County, nothing but assessment work has been done on them for many years. There are said to be some large bodies of low-grade gold ore in the county.

## COSTILLA COUNTY

No work of any kind was done in the mining districts of Costilla County. In the Grayback district, north of Russell, there are some gold placer areas and undeveloped bodies of low-grade gold ore. In the El Plomo district, on Rio Seco, northeast of San Luis, there is said to be a large low-grade gold deposit in quartzite, suitable for quarrying.

## CUSTER COUNTY

Smelting ores, valuable chiefly for their silver content but also carrying lead and copper, were shipped from the Lady Franklin, Maxine Elliot, Passiflora, and Ten-to-One properties, near Westcliffe. One car of lead-silver ore was shipped from the Little Annie claim, near Rosita. The Alaska Mining & Milling Co. continued the remodeling of the Bassick cyanidation plant, brought the electric power line from Ilse, 8 miles distant, and operated the mill for a time on material from the Bassick dump. The cyanide bullion contained 13.2 parts of silver by weight to 1 of gold. The jig and table concentrating mill at the Terrible mine, at Ilse, with a capacity of 200 tons in 24 hours, was operated practically full time the entire year. This mill treats a low-grade cerusite ore, making a product of 70 per cent lead concentrate.

## DOLORES COUNTY

*Dunton district.*—A car of silver smelting ore of relatively high content was shipped from the Emma mine.

*Pioneer district (Rico).*—A car of lead-zinc ore was shipped to Blende, Colo., from the Bancroft mine. A small lot of silver-copper ore was shipped to the Durango smelter from the F. V. G. mine. The Rico Wellington Mining Co. reported the opening of 800 feet of drifts, crosscuts, and raises at the General Sheridan mine and shipments of

<sup>1</sup>For geology and description of mines at Platoro, Gilmore, and Stunner, see Patton, H. B., *Geology and ore deposits of the Platoro-Summitville mining district, Colo.*: Colorado Geol. Survey Bull. 13, 1917. See also Rio Grande County.  
<sup>2</sup>For description of geology, see Patton, H. B., and others, *Geology of the Grayback mining district, Costilla County, Colo.*: Colorado Geol. Survey Bull. 2, 1909; also Van Diest, E. O., and P. H., *Notes on the geology of the Sangre de Cristo Range*: Colorado Sci. Soc. Proc., vol. 6, pp. 76-80, 1894.



500 tons of lead-silver ore to the Durango smelter. Several hundred tons of silver-copper ore and nearly 200 tons of zinc-lead ore were shipped from the Falcon group. A car of lead-silver and several cars of zinc-lead ore were shipped from the Syndicate mine. Several cars of lead-silver ore were shipped from the Yellow Jacket mine.

#### EAGLE COUNTY

*Battle Mountain district (Red Cliff, Gilman).*—A very large quantity of pyrite ore, carrying a relatively low content of silver, some copper, lead, and gold, was shipped from the Eagle mines of the Empire Zinc Co. to the Garfield and Murray smelters, in Utah. In addition, a large quantity of zinc-iron-lead sulphide ore from these mines was moved to Canon City, Colo., for concentration by magnetic separation into high-grade zinc concentrate for roasting to zinc oxide, a low-grade zinc concentrate, and a pyritic lead-silver-gold concentrate. Other producing mines were the Ben Butler, Foster Combination, Ground Hog, Pursey Chester, Silurian, Sulphide Lease, and others. Several cars of iron-manganese ore were shipped to the Colorado Fuel & Iron Co., at Pueblo, from the J. Best claim.

*Brush Creek district (Eagle).*—Very little work was done in 1923 in driving the adit to cut the Lady Belle-North Dakota group at depth.

#### EL PASO COUNTY

At Colorado Springs the Golden Cycle 1,200-ton roast-amalgamation and cyanidation mill was operated steadily but not at full capacity, chiefly on the gold ores from the Cripple Creek district and small lots of gold ore from Boulder County. The Cresson mine, in the Cripple Creek district, continued to contribute about half of the ore treated at the Golden Cycle mill.

#### FREMONT COUNTY

At Canon City the Empire Zinc Co.'s magnetic separation plant was steadily operated on zinc-iron sulphide ore from its Eagle mines at Gilman, Eagle County, and its zinc oxide plant was operated on concentrates from the magnetic separating mill, concentrates from Hanover, N. Mex., and some zinc carbonate ore from Leadville. At Florence the River Smelting & Refining Co.'s matting and fuming plant was operated until November 1. A car of zinc concentrates from previous milling operations at the Cotopaxi mine, at Cotopaxi, was shipped in 1923.

#### GILPIN COUNTY

*Southern districts (Black Hawk, Central City, Nevadaville, Russell Gulch).*—The Polar Star custom amalgamation mill, at Black Hawk, was operated intermittently. The Midwest mill was operated only a short time and only on company ores. Some Gilpin County milling ores were hauled to Idaho Springs for treatment.

No ore was shipped from mines within the town limits of Central City.

In the Enterprise district, below Black Hawk, dry gold ore was shipped to the smelter, and milling gold ore was amalgamated and

concentrated from the Waine group. Silver and lead-silver ore was shipped to smelters from the Champion, Black Jack, and Wheeler.

In the area embracing Gunnell Hill and Eureka and Prosser gulches several cars of lead-silver-gold ore were shipped direct to the Leadville smelter, and milling gold ore from the Rara Avis mine was concentrated into lead-gold-silver concentrate.

In the area embracing the town of Black Hawk and Gregory, Bobtail, and Bates hills 165 tons of gold ore from the Dump lode was treated in a new 10-stamp amalgamation mill on the property, and operations were then abandoned. Other producing mines were the Etna, Mary Miller, Lucky No. 2, Thanksgiving, and Senator.

In the Hughesville-Hawkeye district, north of Black Hawk, the Midwest 100-ton gravity-concentration and oil-flotation mill was operated for a short time on low-grade silver ore from the Cyclops group. Several hundred tons of lead-silver ore was mined from the Atlantic prospect, and several cars of lead-silver ore from the Coyle prospect.

In the Nevada district 100 tons of gold ore from the Columbia tunnel (Argo claim of Kansas Burroughs group) was treated by amalgamation and concentration, and two cars of gold ore were shipped to the A. V. smelter. Mining from the Newhouse (Argo) adit level at the Ophir-Burroughs mine was abandoned in January, 1923.

In the Quartz Valley district several lots of milling ore were mined from the Greenside, Spur Daisy, and Margaret Glennon.

In the Russell Gulch district several cars of smelting silver ore were shipped from the Druid mine; milling gold ore was mined from the Fairfield-Morning Star group; both milling and smelting gold ores were mined from the Jupiter-St. Clair group; milling gold ore from the Davis; and smelting gold ore from the Saratoga and Two Forty.

*Northern district.*—In the Silver Creek district, near Apex, the amalgamation-concentration mill on the Reform Lode group was operated for six months.

Near Rollinsville the Colorado-Penobscot group produced gold ore, which was milled in a concentrating mill on the property. The Smuggler amalgamation mill was operated for a time.

#### GRAND COUNTY

A 2-ton lot of relatively high-grade silver-lead ore was shipped from the Ready Cash mine, in the La Plata district.

#### GUNNISON COUNTY

*Domingo district.*—The Good Hope mine was unwatered to the 600-foot level during the year.

*Goose Creek district (Madera).*—Several hundred tons of arsenic ore was shipped from the Goose Creek district to the Globe plant, Denver. No settlement was made for the silver in this ore.

*Gold Brick district (Ohio City).*—At the Carter mine 700 feet of drifts and 100 feet of raises were opened, and 3,300 tons of gold ore was milled in the company's 20-stamp amalgamation-concentration mill.

*Quartz Creek district (Pitkin).*—A car of silver ore was shipped to the A. V. smelter, Leadville, from the Maid of Athens group.

THE RICO MINING AND REDUCTION COMPANY

MINUTES OF MEETING OF THE RICO MINING AND REDUCTION COMPANY, HELD AT ROOM 1113 FIRST NATIONAL BANK BUILDING IN THE CITY AND COUNTY OF DENVER, STATE OF COLORADO, AT 10:30 O'CLOCK A. M. ON THE 11TH DAY OF JUNE, A. D. 1925, PURSUANT TO WRITTEN WAIVER OF NOTICE THEREOF, SIGNED BY ALL OF THE INCORPORATORS, FIXING SAID TIME AND PLACE OF SAID MEETING.

-----oOo-----

P R E S E N T :

GEORGE K. THOMAS,

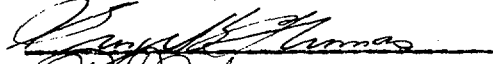
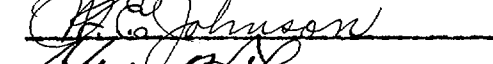
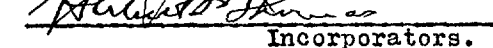
W. E. JOHNSON, and

HUBERT F. THOMAS.

being all of the incorporators of The Rico Mining and Reduction Company. George K. Thomas was chosen Chairman and W. E. Johnson was chosen Secretary of the meeting.

The Chairman presented written waiver of notice of the meeting which was ordered incorporated in these minutes to be and constitute the original of such waiver, which is accordingly done, the same being in words and figures as follows:-

We, the undersigned incorporators of The Rico Mining and Reduction Company, a corporation under the laws of the State of Colorado, do hereby waive notice of the time, place and purposes of the first meeting of the incorporators, and fix the 11th day of June, A. D. 1925, at 10:30 o'clock A. M. as the time and Room 1113 First National Bank Building, Denver, Colorado, as the place of said meeting, and consent to the transaction of such business as may come before it.

Incorporators.

H.F.T.

The Chairman then reported that duly executed copies of the Articles of Incorporation of the Company had been filed in the office of the Secretary of State of the State of Colorado, and in the offices of the Clerk and Recorder of the City and County of Denver and of the County of Dolores, State of

Colorado, on the 5th day of June, A. D. 1925, and presented a counterpart of said Articles, together with Certificate of Authority issued by the Secretary of State of the State of Colorado. Thereupon the said Articles of Incorporation were ordered to be spread upon these minutes and a copy of said Certificate of Authority to be incorporated herein, which is accordingly done, the same being in words and figures, as follows:-

ARTICLES OF INCORPORATION

-of-

THE RICO MINING AND REDUCTION COMPANY

-----oOo-----

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned, George K. Thomas, W. E. Johnson and Hubert F. Thomas, of the City and County of Denver, State of Colorado, being desirous of associating ourselves together and of organizing a corporation under the laws of the State of Colorado, have hereby agreed among ourselves and do hereby Certify as follows:-

ARTICLE I.

Name.

The name of our said corporation shall be THE RICO MINING AND REDUCTION COMPANY.

ARTICLE II.

Objects.

The objects and purposes for which our said corporation is organized are:-

1. To purchase, acquire, hold, operate and enjoy titles in mines, mining claims and mining properties, wherever situated; to lease such real estate from the owners thereof and/or to acquire such leases by assignment or purchase from the lessees thereof, and to operate such mines and mining claims under such leases according to the terms thereof; also to acquire, purchase, hold and enjoy any other real estate necessary or expedient for the enjoyment and operation of such mines and mining property.

2. To erect, own, lease and operate refineries, reduction, concentration and flotation mills, smelters or other methods or processes of treating, concentrating, reducing and refining ores; to purchase ores from others for such treatment and/or treat and reduce the same for the owners thereof for profit; to own, lease and operate sampling and testing works; to sell, transfer, convey and assign mines, mining property, mining leases, ores or the contents thereof when and as desired and to make, execute and deliver any and all conveyances essential to the sale and transfer of any and all real estate of whatever character which may be acquired, purchased or leased by our said company.

3. To borrow money when and as needed for the prosecution of the business of our said corporation, and to execute and deliver all bonds, notes, mortgages, deeds of trust or other securities which may be required for the exercise of this power.

4. To make contracts to do any lawful business whatsoever.

5. To acquire by purchase or otherwise and to hold and vote or sell, transfer, pledge or otherwise dispose of bonds, stock or other securities of this or of any other corporation, firms, persons or individuals now or hereafter existing.

6. To do any and all things and exercise all powers essential or expedient to the exercise of each and every of the powers and authority hereinabove specified and to carry on any business incidental or necessary thereto.

The foregoing enumeration of the above objects, purposes and powers of our said corporation is not intended and shall not be construed to prohibit or limit the exercise of any other or further rights and powers which may now or hereafter be authorized or permitted by law.

#### ARTICLE III.

##### Term

The term of existence of our said corporation shall be twenty (20) years, unless sooner disincorporated or dissolved in accordance with the laws of the State of Colorado.

#### ARTICLE IV.

##### Capital Stock.

The total authorized capital stock of our said corporation shall be ten thousand (10,000) shares common stock, without nominal or par value, and Four Hundred Thousand Dollars (\$400,000.00) preferred stock divided into four thousand (4,000) shares of the par value of One Hundred Dollars (\$100.00) each;

all of said stock to be issued fully paid and non-assessable.

The rights, privileges and conditions which shall attach to the foregoing shares are:-

1. On and after the 1st day of January, 1926, the preferred stock shall be entitled out of surplus net profits, whenever declared by the Board of Directors, to cumulative dividends at the rate of but not exceeding eight per cent. (8%) per annum for each and every year thereafter, or from the issuance thereof (if issued after January 1st, 1926) and no more, payable quarter-yearly in preference and priority to any payment of any dividend on the common stock, the date of payment of the quarterly dividend to be fixed by the Board of Directors; any preferred stock issued between dividend dates shall be entitled at the next dividend date to its proportional dividend at the rate aforesaid for the fractional period. In the event of the dissolution of the corporation, or of the distribution of its assets, or any portion thereof, by way of return of capital, the holders of the preferred stock shall be entitled to receive and be paid out of the surplus funds of the corporation or out of the assets so distributed, sums up to the par value of their preferred shares before anything shall be paid therefrom to the holders of the common stock. The holders of preferred stock shall not be entitled to any further share in the profits of the company or to any further payment in the event of dissolution or distribution of assets by way of return of capital, than as above provided. On and after January 1st, 1926, the dividends upon the preferred stock shall be cumulative and if the dividend be not paid or fully paid in any year thereafter, said dividend, or the deficiency as the case may be, shall be made up and paid from profits in the subsequent year or years without interest and no dividend shall be declared on the common stock until such dividends of deficiency as the case may be, shall have been made up and paid.

2. So long as said dividends on said preferred stock shall be paid quarter-yearly as aforesaid, the holders of the preferred stock shall have no voting power on any question, except as hereinafter provided, but should any dividend on any preferred stock be not paid when payable and remain so unpaid for a period of one year, then and as long as such dividend, or any part thereof remains unpaid, the holders of the preferred stock, in respect of which such dividend or part thereof remains unpaid, shall be entitled to the same voting powers thereon as belong to the common stock, but upon such dividend or unpaid part thereof being paid, the voting power upon said preferred stock shall again cease, and so on, from time to time, as said dividend or part thereof may remain unpaid for said one year period or may be paid as aforesaid. Provided always, that upon any question relating to the increase of the preferred capital stock of the company, the holders of the preferred stock shall be entitled to the same voting powers as belong to the common stock.

3. The common stock shall be subject to the prior rights of the holders of the preferred stock as above provided. If, after providing for the payment of full dividends for any year on the preferred stock, there shall remain any surplus net profits, any and all such surplus net profits of such year and of any other year for which full dividends shall have been paid on the preferred stock, shall be applicable to dividends upon the common stock, when and as, from time to time, the same shall be declared by the Board of Directors. In the event of the dissolution of the corporation or of a distribution of its assets, or of any portion thereof by way of return of capital, the holders of the common stock shall, after the holders of the preferred stock have received the par value of their preferred shares, be entitled to receive the balance of the surplus funds of the corporation or of the assets so distributed.

4. The said preferred stock may be retired or reduced upon any dividend date after January 1st, 1926, at par plus a premium of Ten Dollars (\$10.00) upon each preferred share retired or called.

#### ARTICLE V.

##### Directors.

The management of the affairs of our said corporation shall be vested in a Board of five (5) Directors. The directors who shall manage the affairs of our said corporation for the first year of its existence, or until their successors shall be duly qualified and elected, are:- GEORGE K. THOMAS, W. E. JOHNSON, HUBERT F. THOMAS, W. O. MERRYWEATHER and PAUL B. GAYLORD. Meetings, both of the Board of Directors and of stockholders, may be held outside of the State of Colorado at such place or places as may be, from time to time, designated by the By-Laws or by resolution of the stockholders or directors of this corporation, except as otherwise required by the laws of the State of Colorado.

#### ARTICLE VI.

##### Place of Business.

The principal business and operations of our said corporation shall be conducted and carried on in the City and County of Denver and the County of Dolores, State of Colorado, and the principal office and place of business within the State of Colorado where such books and records shall be kept as may be required by laws of the State of Colorado is No. 1113 First National

## RECORD OF PROCEEDINGS

100 LEAVES

Bank Building, Denver, Colorado, the statutory agent in charge thereof being George K. Thomas; without prejudice, however, to the rights which our said corporation shall have, by agencies or otherwise, to conduct and transact any and all of its business and operations in any and all other counties in the State of Colorado, and in the other States, Territories or Colonies of the United States of America, in the District of Columbia and in any and all foreign countries as may be designated by the Board of Directors.

### ARTICLE VII.

#### Voting

Cumulative voting at stockholders' meetings shall not be allowed.

### ARTICLE VIII.

#### By-Laws

The Board of Directors of our said corporation shall have the power to make such prudential By-Laws for the government and management of its affairs as said Board shall, from time to time determine. Such By-Laws, when adopted, shall not be inconsistent with these Articles nor contrary to the laws of the State of Colorado.

WITNESS our hands and seals at Denver, Colorado, this 5th day of June, A. D. 1925.

(Signed) George K. Thomas (SEAL)

" W. E. Johnson (SEAL)

" Hubert F. Thomas (SEAL)

STATE OF COLORADO, }  
 City and County of Denver, } ss.

I, Irene M. Dewsbury, a Notary Public in and for said City and County, in the State aforesaid, do hereby Certify that George K. Thomas, W. E. Johnson and Hubert F. Thomas, who are personally known to me to be the persons whose names are subscribed to the annexed and foregoing Articles of Incorporation, appeared before me this day in person and each, severally, acknowledged that they signed, sealed and delivered the said instrument of writing as their free and voluntary act and deed for the uses and purposes therein set forth.

Given under my hand and Notarial Seal this 5th day of June, A. D. 1925.

My Commission expires September 10th, 1928.

{ Notary }  
 { Seal }

(Signed) Irene M. Dewsbury  
 Notary Public.



S T A T E   O F   C O L O R A D O

Office of the Secretary of State

CERTIFICATE OF AUTHORITY

I, CARL S. MILLIKEN, Secretary of State of the State of Colorado, do hereby certify that on the Fifth day of June, A. D. 1925, at the hour of 2:50 o'clock P. M. there was filed in my office certificate of incorporation of

THE RICO MINING AND REDUCTION COMPANY

NOW, THEREFORE, Pursuant to the provisions of Section Ten (10) of an act entitled, "An Act Relating to Corporations, foreign and domestic, and repealing certain Acts and all Acts and parts of Acts in conflict herewith," approved April 6th, 1901, I do further certify that the said

THE RICO MINING AND REDUCTION COMPANY

has made full payment of all fees and taxes authorized by law to be paid to the Secretary of State and due at the time of the issuance of this certificate.

GREAT SEAL  
of the  
State of  
COLORADO

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the Great Seal of the State of Colorado, at the City of Denver, this Fifth day of June, A. D. 1925.

(Signed) Carl S. Milliken  
Secretary of State.

(Signed) Charles Armstrong  
Deputy.

(Endorsed)  
This Document was written by  
(Signed) M. Fowler  
Stenographer  
Date June 9 - 1925  
Compared by  
(Signed) Hobson & Fowler

# RECORD OF PROCEEDINGS

100 LEAVES

On motion duly made and seconded, and by affirmative vote of all present, the above and foregoing Articles of Incorporation and Certificate of Authority were adopted, acknowledged, ratified and confirmed as the Certificate and Articles of Incorporation of the Company.

The Secretary reported that George K. Thomas, W. E. Johnson, Hubert F. Thomas, W. O. Merryweather and Paul B. Gaylord each subscribe for one share of the Common stock of the Company and pay therefor the sum of Ten Dollars (\$10.00). It was thereupon moved, seconded and carried, that said subscriptions be evidenced and made a part of record in these minutes by the signatures of said parties subscribed hereunto the day and year of this meeting, with the number of shares subscribed for by each set opposite their names.

WITNESSED:	SUBSCRIBERS:	SHARES:
<u>W. E. Johnson</u>	<u>George K. Thomas</u>	1
<u>Hubert F. Thomas</u>	<u>W. E. Johnson</u>	1
<u>W. O. Merryweather</u>	<u>Hubert F. Thomas</u>	H.F.T. 1
<u>Paul B. Gaylord</u>	<u>W. O. Merryweather</u>	W.O.M. 1
<u>George K. Thomas</u>	<u>Paul B. Gaylord</u>	P.B.G. 1

The Secretary further reported that the above persons so subscribing one share each of the Common stock of the Company, are the persons named in the Articles of Incorporation as Directors of the Company for the first year of its existence, or until their successors are elected, appointed and qualified, and that they accordingly do constitute the Board of Directors of the Company.

The organization of the Company being complete and there being no further business to come before the meeting of the incorporators, on motion, duly made, seconded and carried,

RECORD OF PROCEEDINGS

100 LEAVES

the meeting adjourned, sine die.

R. E. Johnson  
Secretary.

MINUTES APPROVED:

Wm. R. Thomas  
R. E. Johnson  
Wm. R. Thomas H.F.I.  
Incorporators.

MINUTES OF FIRST MEETING OF DIRECTORS

THE FIRST MEETING OF THE BOARD OF DIRECTORS OF THE RICO MINING AND REDUCTION COMPANY WAS HELD AT ROOM 1113 FIRST NATIONAL BANK BUILDING, DENVER, COLORADO, ON THE 11TH DAY OF JUNE, A. D. 1925 AT ELEVEN O'CLOCK A. M.

P R E S E N T :

GEORGE K. THOMAS,

W. E. JOHNSON,

HUBERT F. THOMAS,

W. O. MERRYWEATHER, and

PAUL B. GAYLORD.

being all of the members of the Board of Directors of the Company.

George K. Thomas was chosen Chairman and W. E. Johnson was appointed Secretary of the meeting.

It was moved, seconded and carried that waiver of notice by the Directors of this meeting be evidenced by waiver in writing, incorporated in these minutes and signed by them, which is accordingly done; said waiver being in words and figures:-

We, the undersigned Directors of The Rico Mining and Reduction Company, a corporation under the laws of the State of Colorado, do hereby waive notice of the time and place of the first meeting of the Board of Directors and of the business to be transacted at said meeting. We designate the 11th day of June, A. D. 1925 at the hour of eleven o'clock A. M. as the time and Room 1113 First National Bank Building, Denver, Colorado, as the place, and consent to the transaction of such business as may come before the meeting.

George K. Thomas  
W. E. Johnson  
Hubert F. Thomas H.F.T.  
W. O. Merryweather W.O.M.  
Paul B. Gaylord P.B.G.  
 Directors.

The minutes of the meeting of the incorporators were read and approved.

The Secretary presented a form of By-Laws for the government and regulation of the affairs of the Company, which was read, article by article, and upon motion duly made, seconded and unanimously carried, the same was adopted as the By-Laws of this Company, and ordered to be spread upon these minutes, which is accordingly done, the same being in words and figures:-

B Y - L A W S

For the Government of the Affairs of,  
THE RICO MINING AND REDUCTION COMPANY

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ARTICLE I.

Stock

1. Certificates of Stock shall be signed by the President (or Vice-President) and Secretary, and sealed with the corporate seal. Should it be deemed expedient, the Board of Directors may appoint and authorize a transfer agent and registrar for the transfer and registration of stock of this company. A record of all certificates issued by the company shall be made in a stock ledger, to be kept by such officer or agent as the Board of Directors may designate. A duplicate of said stock ledger shall be furnished and maintained by the Statutory Agent of the Company.

2. Transfers of Stock shall be made only upon the books of the Company, and before a new certificate is issued, the old certificate must be surrendered for cancellation. Lost certificates shall not be reissued until due proof of loss and adequate bond of indemnity shall have been filed and accepted by the Board of Directors. The stock books of the company shall be closed thirty (30) days prior to the annual meeting of stockholders and ten (10) days prior to the date of payment of any declared dividend.

ARTICLE II.

Stockholders' Meetings

1. The Annual Meeting of the stockholders of this company shall be held at the principal office of the company in the City and County of Denver, State of Colorado, at two o'clock P. M. on the 15th day of June in each year, unless said day falls on a holiday, in which event, the meeting shall be held on the following day. The first annual meeting shall be held on the 15th day of June, A. D. 1926.

2. Special Meetings of the stockholders, which may be held either within or outside of the State of Colorado, may be called by the President at any time upon resolution of the Board of Directors or upon the written request of stockholders holding not less than two-thirds (2/3) of the outstanding stock.

3. Notices of Meetings, general and special, shall be given as required by the laws of the State of Colorado.

4. A Quorum at any meeting of stockholders shall consist of a majority of issued and outstanding stock represented in person or by proxy. A majority of such quorum shall decide any question before the meeting not inconsistent with the laws of the State of Colorado.

5. The Election of Directors shall be held at the annual meeting of the stockholders, or may be held later at a special meeting called for the purpose.

6. Voting. At all stockholders' meetings, general or special, each share of Common stock represented in person or by proxy shall be entitled to one vote.

As and when designated in the Articles of Incorporation, each share of Preferred stock represented in person or by proxy, shall be entitled to one vote and Common and Preferred votes shall be counted alike.

7. The Order of Business at the annual meeting, and as far as possible at all other meetings of stockholders shall be:-

- (a) Roll Call,
- (b) Proof of due notice of meeting,
- (c) Reading and action upon any unapproved minutes,
- (d) Annual reports of officers and committees,
- (e) Election of directors,
- (f) Unfinished business,
- (g) New Business,
- (h) Adjournment.

ARTICLE III.

Directors.

1. The Business and Property of the company shall be managed by a Board of five (5) Directors, who shall be stockholders, each holding at least one (1) share of Common stock on the books of the company in his name, and who shall be elected annually by ballot at the stockholders' meetings. Any vacancies in the Board may be filled by the Board for the unexpired term.

2. Regular Meetings of the Board of Directors shall be held, without notice, at the principal office of the Company in the City and County of Denver, State of Colorado, on the Twelfth day of each month, unless such day falls on a holiday, in which event, the regular meeting shall be held on the day following.

3. Special Meetings of the Board of Directors may be called by the President upon three (3) days notice to each Director, either personally or by mail or telegraph at any time or place.

4. A Quorum at any Board meeting shall consist of a majority of the entire membership of the Board at the time of the meeting. A majority of such quorum shall decide any question that may come before the meeting.

5. Officers of the Company shall be elected by the Board

of Directors at their first regular meeting after the election of Directors in each year. The Board of Directors shall have power to fill any vacancies in any office for the unexpired term. The Board shall likewise have power to fix the compensation of all officers and to create such other offices or officers as may be necessary and proper, and prescribe their duties and compensation.

ARTICLE IV.

Officers

1. The Corporate Officers shall be a President, a Vice-President, a Treasurer, a Secretary, a Statutory Agent and such other officers as the Board of Directors shall from time to time prescribe. Any two of such offices, except President and Secretary, may be united in one person by the action of the Board. The Secretary need not be a member of the Board of Directors or a stockholder.

2. The President shall preside at all meetings of the Board and shall have general supervision of the affairs of the company. He shall appoint a Chairman and members of all committees. He shall sign or countersign all stock certificates and such other instruments as may be authorized by the Board of Directors. He shall perform such other duties as are incidental to his office or such as may be required of him by the Board of Directors.

3. The Secretary shall issue such notices of stockholders' and directors' meetings as may be required by these By-Laws or the laws of the State of Colorado. He shall keep the minutes of all stockholders' and directors' meetings, and have charge of the corporate seal; he shall sign with the President such instruments as require his signature and shall affix to all instruments, when required, the corporate seal. He shall perform such other duties as are incidental to his office or such as may be required of him by the Board of Directors.



4. The Treasurer shall have custody of all moneys and securities of the company, and shall be its disbursing agent. He shall perform such other duties as are incidental to his office or required of him by the Board of Directors.

5. The Statutory Agent of the corporation shall maintain an office in the City and County of Denver, State of Colorado, and shall accept service of any process which may be served upon the company. He shall also maintain and keep in his office the original or a duplicate stock ledger, open to the inspection of any stockholder of record during business hours. He shall also perform such other duties as are prescribed by the Statutes of the State of Colorado, or as may be required of him by the Board of Directors.

ARTICLE V.

Dividends and Finance.

1. Cash Dividends shall be declared only from the net surplus profits of the company at such times as the Board of Directors shall direct.

2. The Moneys or Funds of the Company shall be deposited in the name of the Company in such banks or trust companies as the Board of Directors may from time to time designate and shall be drawn out only upon check, in the name of the company, signed by such officer or officers as may be designated and authorized by resolution of the Board of Directors.

ARTICLE VI.

Seal

1. The Corporate Seal of this company, in its impression, shall consist of two concentric circles between which shall be the name of the company and the word "Colorado"; and in the inner circle the words "Corporate Seal" and "1925", and such seal when adopted shall be the corporate seal of the company.

ARTICLE VII.

Amendments

1. These By-Laws may be amended, repealed or altered, in whole or in part, by a majority of the Board of Directors at any regular meeting, or at any special meeting where such intended action has been announced in the call and notice thereof.

On motion duly made and seconded, and as to each subscriber duly carried by a majority of the Board, the subscriber not voting, the subscriptions of George K. Thomas, W. E. Johnson, Hubert F. Thomas, W. O. Merryweather and Paul B. Gaylord for one share each of the Common stock of the Company, as evidenced by their subscriptions therefor upon the minutes of the meeting of the incorporators, are accepted by the Board.

On motion duly made and seconded, and upon a ballot being taken on each, the following were unanimously elected as officers of the company to serve until their successors are elected and qualified:-

<u>PRESIDENT:</u>	<u>George K. Thomas,</u>
<u>VICE-PRESIDENT:</u>	<u>Hubert F. Thomas,</u>
<u>SECRETARY:</u>	<u>W. E. Johnson,</u>
<u>TREASURER:</u>	<u>W. O. Merryweather.</u>

The President and Secretary thereupon entered upon their respective duties.

No motion duly made, seconded and carried, it was

R E S O L V E D:

That the appointment of George K. Thomas as Statutory Agent of the Company in the Articles of Incorporation, be and the same is hereby ratified, approved and confirmed.

V O T E D:

On motion duly made and seconded, that the Secretary be and hereby is directed and authorized to obtain stock certificates in form suitable for the use of the company in the issuance of its capital stock; and that the President (or Vice-President) and Secretary be and hereby are authorized to issue certificates of stock in the form so provided; and the

Secretary is further authorized and directed to procure for the use of the Company appropriate and necessary books and keep the same in accordance with the law and as in the By-Laws may be required.

V O T E D :

On motion duly made and seconded, that the Board of Directors issue shares of the capital stock of the company to the full amount authorized by the Articles of Incorporation in such amounts and at such times as shall be determined by the Board, and as may be permitted by law and in their discretion to accept full or part payment for any share or shares such property and such services as the Board may determine to be necessary for the business of the company and the execution of any of the objects of its incorporation.

R E S O L V E D:

Upon motion, duly made and seconded, that the seal presented at this meeting, an impression of which is affixed to the margin of these minutes, be and the same is hereby adopted as the seal of the corporation; and that a certified impression thereof be made and the same is directed to be filed for record with the Secretary of State of the State of Colorado.

The Secretary presented the proposal of Mr. George K. Thomas for payment of his services as attorney in the work of organization of this company and the same was ordered reduced to writing upon these minutes and when so signed to be and constitute the original thereof, which is accordingly done

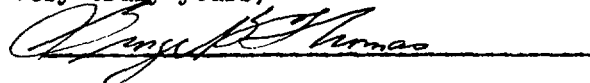
Denver, Colorado,  
June 11th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

As payment in full for services rendered as attorney-at law in the drafting, preparation, filing and organization of your corporation, I am willing to accept 100 shares of your Common stock and one share of Preferred stock to be issued fully paid and non-assessable.

Very truly yours,



RECORD OF PROCEEDINGS

100 LEAVES

Mr. George K. Thomas thereupon withdrew from the meeting and the Vice-President. Hubert F. Thomas, filled the chair. After a full discussion thereof the following resolution was moved, seconded and carried:-

WHEREAS, an offer on the part of George K. Thomas, Attorney, has been received to accept in full payment for services rendered as attorney to this company in its organization, 100 shares of its Common stock and one (1) share of its Preferred, and it is the opinion of the Board of Directors that the offer is a fair one and the services rendered are of the value of said shares of stock.

NOW, THEREFORE, BE IT RESOLVED, that the offer of George K. Thomas, Attorney, be accepted and that the President and Secretary be and they are hereby authorized, empowered and instructed to make, execute and deliver unto George J. Thomas, certificate <sup>numbered</sup> or certificates of the capital stock of this company for ~~one~~ (100) shares of the Common and one (1) share of the Preferred.

The Secretary then presented to the meeting a proposal of Mr. C. Sewell Thomas of Denver, Colorado, which was ordered spread upon these minutes for signature by him and when so signed, to be and constitute the original thereof, the same being in words and figures as follows:-

Denver, Colorado,  
June 11th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

As agent for the respective groups hereinafter mentioned, I hereby offer to sell, assign and transfer to your Company the following mines or properties in the County of Dolores, State of Colorado, in consideration of the issuance of six thousand, eight hundred ninety-five (6,895) shares of your Common stock to myself, and three thousand shares of your Common stock to the M. L. S. Mining Company:-

1. Lease and option upon the Iron Mines Group, purchase price \$12,000.00, and royalty 20%.

RECORD OF PROCEEDINGS

100 LEAVES

2. Lease and option upon the A. B. G. Group, purchase price \$32,500.00, and 20% royalty.
3. Lease and option upon the Lillie D. Group, purchase price \$40,000.00, and 20% royalty.
4. Lease and option upon the Bertha S. Group, purchase price \$40,000.00, and 20% royalty.
5. Lease and option upon the Swan Group, purchase price \$60,000.00; royalty, 20% on ores less than \$50.00 gross value and 25% on ores over \$50.00 gross.
6. Lease and option upon Argentine Group, purchase price \$40,000.00, 25% royalty.
7. Lease and option upon the Lookout claim, purchase price \$1,200.00, 15% royalty.
8. Lease and option upon the Zwickheimer group, purchase price \$8,000.00, 10% royalty.

In the event your corporation desires these properties, I shall transfer or cause to have the same transferred upon the understanding that the Common stock issued in payment thereof be issued fully paid and non-assessable, at such times and in such amounts as I may request.

Very truly yours,



After discussion thereof, the following resolution was moved, seconded and carried:-

WHEREAS, there has been received from C. Sewell Thomas of Denver, Colorado, an offer to transfer unto this corporation leases and options upon certain mining properties in the County of Dolores, State of Colorado, in consideration of the issuance to said C. Sewell Thomas or his order, and The M. L. S. Mining Company, of shares of the Common stock of this Company as in said offer more fully set forth; and

WHEREAS, in the opinion of this Board of Directors, said leases and options are of the value of the shares of Common stock respectively, for which the same are proposed to be transferred;

NOW, THEREFORE, BE IT RESOLVED, That the said offer of C. Sewell Thomas be and the same is hereby accepted; that the consideration therein stated is adequate and of equal value to the shares of Common stock therein called for, and that the President and Secretary upon transfer thereof being made, be and they are hereby authorized, empowered and instructed to make, execute and deliver unto C. Sewell Thomas or his order, shares of the Common stock of this Company fully paid and non-assessable up to the number of shares called for in said offer, the acceptance of which is hereby recorded.



The Secretary then presented the resignation of George K. Thomas as a Director and as President of this Company, the same being in words and figures as follows:-

Denver, Colorado,  
June 11th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

I hereby tender my resignation as a Director and as President of your Company, to take effect at the pleasure of your Board.

Respectfully,




Thereupon, on motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D:

That the resignation of George K. Thomas as a Director and as President of this company be and the same is hereby accepted, to take effect immediately after the close of this meeting.

Thereupon after due nomination had been made, and upon motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D:

That  of Denver, Colorado, be elected as Director and President of this company to fill the vacancy which will occur by the resignation of George K. Thomas.

The Secretary then presented the resignation of Hubert F. Thomas as a Director and as Vice-President of this Company, the same being in words and figures as follows:-

RECORD OF PROCEEDINGS

100 LEAVES

Denver, Colorado,  
June 11th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

I hereby tender my resignation as a Director and as  
Vice-President of your company, to take effect at the pleasure  
of your Board.

Respectfully,

 H.F.T.

Thereupon, on motion duly made, seconded and carried, by  
a majority of the entire membership of the Board, it was

V O T E D:

That the resignation of Hubert F. Thomas as a Director  
and as Vice-President of this company be and the same is hereby  
accepted, to take effect immediately after the close of this meet-  
ing.

Thereupon, after due nomination had been made, and upon  
motion duly made, seconded and carried by a majority of the entire  
membership of the Board, it was

V O T E D:

That *George L. Greene* of Denver, Colorado, be elected  
as Director and as Vice-President of this Company to fill the  
vacancy which will occur by the resignation of Hubert F. Thomas.

The Secretary then presented the resignation of W. O.  
Merryweather as a Director and as Treasurer of this Company, the  
same being in words and figures as follows:-

Denver, Colorado,  
June 11th, 1925.


To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

I hereby tender my resignation as a Director and as  
Treasurer of your Company to take effect at the pleasure of your  
Board.

Respectfully,

22

 W.O.M.

RECORD OF PROCEEDINGS

100 LEAVES

Thereupon, on motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D:

That the resignation of W. O. Merryweather as a Director and as Treasurer of this Company be and the same is hereby accepted, to take effect immediately after the close of this meeting.

Thereupon, after due nomination had been made, and upon motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D :

That *George K. Thomas* of Denver, Colorado, be elected as Director and Treasurer of this company to fill the vacancy which will occur by the resignation of W. O. Merryweather.

The Secretary then presented the resignation of W. E. Johnson as a Director and as Secretary of this Company, the same being in words and figures as follows:-

Denver, Colorado,  
June 11th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

I hereby tender my resignation as a Director and as Secretary of your Company, to take effect at the pleasure of your Board,

Respectfully,

*W. E. Johnson*

Thereupon, on motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D :

That the resignation of W. E. Johnson as a Director and as Secretary of this Company be and the same is hereby accepted, to take effect immediately after the close of this meeting.



Thereupon, after due nomination had been made, and upon motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D:

That *W.E. Johnson* of Denver, Colorado, be elected as a Director and as Secretary of this Company to fill the vacancy which will occur by the resignation of W. E. Johnson.

The Secretary then presented the resignation of Paul B. Gaylord as a Director of this Company, the same being in words and figures as follows:-

Denver, Colorado,  
June 11th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

I hereby tender my resignation as a Director of your Company, to take effect at the pleasure of your Board.

Respectfully,

*Paul B. Gaylord* P.B.

Thereupon, on motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D:

That the resignation of Paul B. Gaylord as a Director of this company be and the same hereby is accepted, to take effect immediately after the close of this meeting.

Thereupon, after due nomination had been made, and upon motion duly made, seconded and carried by a majority of the entire membership of the Board, it was

V O T E D:

That *Irene Densbury* of Denver, Colorado, be elected as a Director of this Company to fill the vacancy which will occur by the resignation of Paul B. Gaylord.

There being no further business to come before the meeting, on motion duly made, seconded and carried, the same was adjourned sine die.

W. E. Johnson  
Secretary.

MINUTES APPROVED:

<u>George B. Thomas</u>	
<u>W. E. Johnson</u>	
<u>George B. Thomas</u>	HFT
<u>Womunpaxat</u>	WOM
<u>Paul B. Gaylord</u>	P.B.F.

Directors.

RECORD OF PROCEEDINGS

100 LEAVES

MINUTES OF REGULAR MEETING OF THE BOARD OF DIRECTORS OF THE RICO MINING AND REDUCTION COMPANY HELD AT THE OFFICE OF THE COMPANY IN DENVER, COLORADO, on TUESDAY, THE 13th DAY OF OCTOBER, A. D. 1925, AT TEN O'CLOCK A. M.

---oQo---

The Twelfth day of October, 1925, being a holiday, the regular meeting of the Board of Directors of The Rico Mining and Reduction Company was held at the office of the Company, No. 515 First National Bank Building, Denver, Colorado, on Tuesday, the 13th day of October, 1925, at the hour of ten o'clock A.M.

P R E S E N T:

Directors

SEWELL THOMAS,

GEORGE L. GREENE,

GEORGE K. THOMAS,

W. E. JOHNSON, and

IRENE DEWSBURY,

being all of the Board of Directors of the Company.

On motion duly made, seconded and carried, it was

V O T E D:

That the office of General Manager be created and that the General Manager, subject to the authority of the Board of Directors, President, Secretary and Treasurer of the Company, attend to the management, development and equipment of the Company's properties and to preserve the title to the same by attending to the payment from time to time of moneys which may become due upon the respective options under which the properties are held; that said authority and appointment continue until the further pleasure of the Board.

The Secretary presented the resignation of Mr. Sewell Thomas as President of the Company, the same being in

RECORD OF PROCEEDINGS

100 LEAVES

words and figures as follows:-

Denver, Colorado,  
October 13th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company.

Gentlemen:-

I hereby tender my resignation as President of your  
Company to take effect at the pleasure of your Board.

Respectfully,

*Edmund Thomas* CST

On motion duly made, seconded and carried, the resignation of Mr. Sewell Thomas as President of this Company was accepted to take effect immediately after the close of this meeting.

The Secretary thereupon presented the resignation of Irene Dewsbury as a Director of this Company, the same being in words and figures as follows:-

Denver, Colorado,  
October 13th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company.

Gentlemen:-

I hereby tender my resignation as a Director of  
your Company to take effect at the pleasure of your Board.

Respectfully,

*Irene Dewsbury* IS

On motion duly made, seconded and carried, it was

V O T E D :

That the resignation of Irene Dewsbury as a Director of this Company be and the same hereby is accepted to take effect immediately after the close of this meeting.

Thereupon, on motion duly made, seconded and carried, it was

V O T E D :

That Mr. George O. Carpenter of St. Louis, Missouri, be elected a Director and President of this Company to fill the vacancies which will occur by the resignations of Mr. Sewell Thomas as President and Irene Dewsbury as Director.

The Secretary thereupon presented the resignation of Mr. George L. Greene as a Director and as Vice-President of this Company, the same being in words and figures as follows:

Denver, Colorado,  
October 13<sup>th</sup>, 1925.

To the Board of Directors, of  
The Rico Mining and Reduction Company.

Gentlemen:-

I hereby tender my resignation as a Director and as Vice-President of your Company to take effect at the pleasure of your Board.

Respectfully,

George L. Greene

GLG

On motion duly made, seconded and carried, the resignation of George L. Greene as a Director and as Vice-President of this Company was accepted to take effect immediately after the close of this meeting.

Thereupon after due nomination has been made and on motion duly made, seconded and carried, it was

V O T E D :

That Sewell Thomas of Denver, Colorado, be elected Vice-President of this Company to fill the vacancy which will occur through the resignation of George L. Greene, and that Charles E. Schwarz of St. Louis, Missouri, be elected a Director of this Company to fill the vacancy which will occur through the resignation of Mr. George L. Greene as Director.

The Secretary thereupon presented the resignation of George K. Thomas as Director and Treasurer of this Company, the same being in words and figures as follows:-

Denver, Colorado,  
October 13th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

I hereby tender my resignation as a Director and as Treasurer of your Company to take effect at the pleasure of your Board.

Respectfully,



Thereupon on motion duly made, seconded and carried, it was

V O T E D :

That the resignation of George K. Thomas as Director and Treasurer of this Company be and the same is hereby accepted to take effect immediately after the close of this meeting.

On motion duly made, seconded and carried, it was

V O T E D :

That Mr. James A. Caselton of St. Louis, Missouri, be elected a Director and Treasurer of this Company to fill the vacancy which will occur through the resignation of Mr. George K. Thomas.

The Secretary thereupon presented the resignation of W. E. Johnson as Director and Secretary, the same being in words and figures as follows:-

RECORD OF PROCEEDINGS

100 LEAVES

Denver, Colorado,  
October 12th, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company.

Gentlemen:-

I hereby tender my resignation as a Director and  
as Secretary of your Company to take effect at the pleasure  
of your Board.

Respectfully,

W. E. Johnson

W E J

On motion duly made, seconded and carried, it was

V O T E D :

That the resignation of W. E. Johnson as Director  
and as Secretary of your Company be and the same is hereby  
accepted to take effect immediately after the close of this  
meeting.

Thereupon on motion duly made, seconded and carried  
it was

V O T E D :

That W. D. Wright, Jr. of Denver, Colorado, be  
elected a Director and Secretary of this Company to fill the  
vacancy which will occur through the resignation of W. E.  
Johnson.

There being no further business to come before the  
meeting, on motion, the same adjourned sine die.

W. E. Johnson  
Secretary.

W E J

MINUTES APPROVED:

CST

C. Sewell Thomas

GLG

George Greene

W E J

C. Sewell Thomas

IS

W. E. Johnson

Irene Deschamps

D I R E C T O R S .

MINUTES OF A SPECIAL MEETING OF THE BOARD OF DIRECTORS OF THE RICO MINING AND REDUCTION COMPANY, HELD AT THE OFFICE OF THE COMPANY IN DENVER, COLORADO, ON TUESDAY, THE 20TH DAY OF OCTOBER, 1925, AT TEN O'CLOCK A.M.

---oOo---

At a Special Meeting of the Board of Directors of The Rico Mining and Reduction Company, held at the office of the company at No. 515 First National Bank Building, Denver, Colorado, on Tuesday, the 20th day of October, 1925, at ten o'clock A.M., the following business was transacted by consent, as evidenced by the signatures of all of the Directors to these minutes, viz:

The Secretary presented the resignation of W. D. Wright, Jr., as director and Secretary of the Company, the resignation being as follows:

Denver, Colorado  
October 20, 1925.

To the Board of Directors of  
The Rico Mining and Reduction Company,

Gentlemen:-

I hereby tender my resignation as a director of your Company, and as Secretary of your Company, to take effect at the pleasure of the Board.

Respectfully,

(Signed) W.D. Wright, Jr.

On motion duly made, seconded and unanimously carried, the resignation of Mr. Wright, as Secretary and a director of the Company, was accepted, to take effect immediately after the close of this meeting.

Thereupon, upon motion duly made, seconded and carried, it was

V O T E D:

That H. H. Utley, of Florence, Colorado, a stockholder in this Company, be elected a director of the Company, to fill the vacancy which will occur at the close of this meeting by the resignation of W. D. Wright, Jr.



Following this, upon motion duly made, seconded and carried, it was

V O T E D:

That James A. Caselton be elected Secretary of the Company to assume office at the close of this meeting, and thereby fill the vacancy caused by the resignation of W. D. Wright, Jr.

Thereupon, upon motion duly made, seconded and carried, it was

V O T E D:

That W. D. Wright, Jr. be appointed Assistant Secretary of the Company.

Thereupon, upon motion duly made, seconded and carried, it was

V O T E D:

That S. M. Walker be and hereby is appointed General Manager of the Company to serve during the pleasure of this Board of Directors.

Thereupon, upon motion duly made, seconded and carried, the following resolution was unanimously adopted:

RESOLVED, That C. Sewell Thomas, as Vice President, or S. M. Walker as General Manager, or W. D. Wright, Jr., as Assistant Secretary, or J. F. Koenig as Cashier be and they hereby are authorized to endorse all checks, drafts, notes, or other paper for deposit in the Colorado National Bank of Denver to the credit of this Company for its use and benefit, and that any two of the above named officers may draw, sign and deliver in the name of this Company all checks against the funds of this Company on deposit in said bank, and, upon such checks

to withdraw from said bank such funds, and to do all other acts and things as may be incidental to the authority and powers hereinbefore given."

It was further, upon motion duly made, seconded and carried

V O T E D :

That the Vice President and Secretary of the company be authorized and directed to prepare and file with The Colorado National Bank, the necessary certificate showing the adoption of the above resolution.

There being no further business to come before the meeting, on motion duly seconded, the same adjourned.

*Jameson*  
Secretary

MINUTES APPROVED:

*Geo. A. Carpenter*  
*Charles E. Schwan*  
*W. H. Little*  
*C. Sewell Thomas*  
*Jameson*

DIRECTORS:

MINUTES OF A SPECIAL MEETING  
OF THE BOARD OF DIRECTORS

Saint Louis, Missouri,  
February 11, 1927.

A Special Meeting of the Board of Directors of the Rico Mining and Reduction Company was held in Rooms 812-825 International Life Building, St. Louis, Missouri, on the above date, pursuant to notice duly given.

The following members constituting a quorum were present:

Geo. O. Carpenter  
Charles E. Schwarz  
James A. Caselton

Mr. Geo. O. Carpenter, President of the Company, acted as Chairman of the meeting and Mr. J. A. Caselton, Secretary of the Company, acted as Secretary of the meeting.

The resignation of Mr. Sewell Thomas as Vice President and Director of the Company was presented to the meeting, and, upon motion duly seconded, the said resignation was accepted effective as of January 1, 1927.

Mr. J. A. Caselton thereupon presented his resignation as Treasurer of the Company and, upon motion duly seconded, the said resignation was accepted effective immediately.

Mr. J. A. Caselton was then nominated to fill the office of Vice President of the Company made vacant by the resignation of Mr. Sewell Thomas and there being no further nominations the Secretary was instructed to cast the ballot of the Board in favor of Mr. Caselton as Vice President of the Company, which resulted in his election to hold office until the next annual election or until his successor is duly elected and qualified.

Mr. O. H. Greene was then nominated for election as a Director of the Company in lieu of Mr. Sewell Thomas, resigned,

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and there being no further nominations the Secretary was instructed to cast the ballot of the Board in favor of the election of Mr. Greene, which resulted in his election as Director of the Company until the next annual meeting of stockholders or until his successor is duly elected and qualified.

Mr. O. H. Greene was then nominated to fill the office of Treasurer of the Company made vacant by the resignation of Mr. J. A. Caselton and there being no further nominations the Secretary was instructed to cast the ballot of the Board in favor of the election of Mr. Greene as Treasurer of the Company, which resulted in his election to hold office until the next annual meeting or until his successor is duly elected and qualified.

Mr. Charles E. Schwarz was then nominated to fill the office of Assistant Secretary of the Company. There being no further nominations, the Secretary was instructed to cast the ballot of the Board in favor of the election of Mr. Schwarz as Assistant Secretary of the Company, which resulted in his election to hold office until the next annual election or until his successor is duly elected and qualified.

Upon motion duly seconded it was

RESOLVED, that the President of the Company be and he hereby is directed to call a Special Meeting of the Stockholders of the Company to be held in rooms 812-825, International Life Building, 722 Chestnut Street, St. Louis, Missouri, on Friday, April 26, 1927, to consider a proposition looking to the sale to the St. Louis Smelting & Refining Company of all of its properties, real and personal, and assets, including bills receivable, contracts, etc., and in the event of authorization of such sale to authorize the dissolution of the Company as and when the said sale shall have been fully effectuated.

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There being no further business before the meeting, it was, on motion duly seconded, adjourned.

  
Secretary.



MINUTES OF SPECIAL MEETING OF DIRECTORS

of

RICO MINING & REDUCTION COMPANY

A Special Meeting of the Directors of the Rico Mining & Reduction Company was held in Room 812 International Life Building, 722 Chestnut Street, Saint Louis, Missouri, on April 26, 1927, at the hour of two o'clock P.M., pursuant to notice duly given, at which were present the following Directors constituting a quorum; viz: Geo. O. Carpenter, O. H. Greene, C. E. Schwarz, J.A. Caselton; absent, H. H. Utley.

Mr. Geo. O. Carpenter, President of the Company, acted as Chairman of the meeting, and Mr. J. A. Caselton acted as Secretary of the meeting.

The Chairman laid before the meeting minutes of a special meeting of the shareholders of this Company held this morning in Room 812 International Life Building, 722 Chestnut Street, Saint Louis, Missouri, and called attention to the action taken thereat by the shareholders.

On motion of Mr. Greene, seconded by Mr. Schwarz, the following resolution was unanimously adopted:-

RESOLVED, that pursuant to the action taken by the shareholders at a meeting this day held, the following proposition of St. Louis Smelting & Refining Company be and the same is hereby accepted; viz:

"Rico Mining & Reduction Company,  
722 Chestnut Street,  
Saint Louis, Missouri.

Gentlemen:-

The undersigned, St. Louis Smelting & Refining Company, hereby submits to you the following proposition:

That, if your Company will convey to the St. Louis Smelting & Refining Company all of the property and assets owned by your Company including all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado, or

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elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights, St. Louis Smelting & Refining Company will assume and pay all current debts and obligations or Rico Mining & Reduction Company (except capital stock liability).

Yours very truly,

ST. LOUIS SMELTING & REFINING COMPANY,

(signed) J. A. Caselton,  
Vice President. "

and be it further

RESOLVED, that this Company convey to said St. Louis Smelting & Refining Company all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado, or elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights in consideration of the assumption by said St. Louis Smelting & Refining Company of the obligation to pay all current debts of this Company (except capital stock liability);

and be it further

RESOLVED, that the proper officers of this Company be and they hereby are authorized to make, execute, enseal, acknowledge and deliver on behalf of this Company all appropriate deeds, assignments, bills of sale and/or other instruments in writing to said St. Louis Smelting & Refining Company and to do all other acts and things necessary and proper to effectuate the intents and purpose of this resolution.

On motion of Mr. Greene, seconded by Mr. Schwarz, the following resolution was unanimously adopted:

RESOLVED, that after this Company shall have conveyed to St. Louis Smelting & Refining Company all of its property and assets, as heretofore authorized by the shareholders and by this Board, its corporate existence be dissolved at such time and in such manner as may be directed by the officers of this Company;

and be it further

RESOLVED, that whenever the officers of this Company deem it advisable to dissolve the corporate existence of this Company the proper officers of this Company be and they hereby are authorized and directed to take all steps and to do all acts and things necessary and proper to dissolve the corporate existence of this Company.

There being no further business before the meeting, the same, on motion duly seconded, adjourned.

\_\_\_\_\_  
Secretary.



MINUTES OF MEETING OF STOCKHOLDERS OF  
RICO MINING & REDUCTION COMPANY

A Special Meeting of the stockholders of Rico Mining & Reduction Company was held in Room 812 International Life Building, 722 Chestnut Street, St. Louis, Missouri, on April 26, 1927, commencing at the hour of nine o'clock A.M., pursuant to notice duly given.

The following shareholders, constituting a quorum, were present in person or by proxy:

<u>Name</u>	<u>Class of Stock</u>		<u>No. of Shares</u>
Geo. O. Carpenter	No par value	In person	1
O. H. Greene	No par value	In person	1
C. E. Schwarz	No par value	In person	1
H. H. Utley	No par value	By proxy, J. A. Caselton	1
J. A. Caselton	No par value	In person	9,996
J. A. Caselton	Preferred	In person	4,000

Mr. Geo.O.Carpenter, President of the Company, was duly elected chairman of the meeting and Mr. J. A. Caselton acted as secretary of the meeting.

The Chairman laid before the meeting the following written proposition of St. Louis Smelting & Refining Company:

"Rico Mining & Reduction Company,  
722 Chestnut Street,  
Saint Louis, Missouri.

Gentlemen:-

The undersigned, St.Louis Smelting & Refining Company, hereby submits to you the following proposition:-

That, if your Company will convey to the St.Louis Smelting & Refining Company all of the property and assets owned by your Company including all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado or elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights, St. Louis Smelting & Refining Company will assume and pay all current debts and obligations of Rico Mining & Reduction Company (except capital stock liability).

Yours very truly,  
ST.LOUIS SMELTING & REFINING COMPANY,

(signed) J. A. Caselton,  
Vice President. "

Page 2.

On motion, duly made and seconded, the following resolution was submitted to the meeting:-

RESOLVED, that this Company accept the foregoing proposition of St. Louis Smelting & Refining Company and that this Company convey to said St. Louis Smelting & Refining Company all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado or elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights in consideration of the assumption by said St. Louis Smelting & Refining Company of the obligation to pay all current debts of this Company (except capital stock liability).

This resolution was put to a viva voce vote of the shareholders and upon canvassing the vote it appeared that all of the shareholders had voted in favor of the same and that none had voted against it.

The Chairman thereupon declared that the said resolution had been duly adopted.

Thereupon, on motion duly made and seconded, the following resolution was submitted to the meeting:-

Whereas, after this Company shall have conveyed all of its properties and assets to St. Louis Smelting & Refining Company, as heretofore authorized by the shareholders at this meeting, the Company will have no property or assets with which to continue in business;

No, therefore, be it

RESOLVED, that the Board of Directors of this Company be and it hereby is authorized and directed to cause the dissolution of the corporate existence of this Company at such time and in such manner as said Board in its discretion may deem advisable.

Said resolution was put to a viva voce vote of the shareholders and upon canvassing the vote it appeared that all of the shareholders had voted in favor of the same and that none had voted against it.

The Chairman, thereupon, declared that said resolution had

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been duly adopted.

There being no further business before the meeting, the same was, on motion duly made and seconded, adjourned.

---

Secretary.

April 26, 1927.

Rico Mining & Reduction Company,  
722 Chestnut Street,  
Saint Louis, Missouri.

Gentlemen:-

The undersigned, St. Louis Smelting & Refining Company,  
hereby submits to you the following proposition:-

That, if your Company will convey to the St. Louis Smelting & Refining Company all of the property and assets owned by your Company including all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado or elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights, St. Louis Smelting & Refining Company will assume and pay all current debts and obligations of Rico Mining & Reduction Company (except capital stock liability).

Yours very truly,

ST. LOUIS SMELTING & REFINING COMPANY,

By



Vice-President.

MINUTES OF MEETING OF STOCKHOLDERS OF  
RICO MINING & REDUCTION COMPANY

A Special Meeting of the stockholders of Rico Mining & Reduction Company was held in Room 812 International Life Building, 722 Chestnut Street, St. Louis, Missouri, on April 26, 1927, commencing at the hour of nine o'clock A.M., pursuant to notice duly given.

The following shareholders, constituting a quorum, were present in person or by proxy:

<u>Name</u>	<u>Class of Stock</u>	<u>No. of Shares</u>
Geo. O. Carpenter	No par value In person	1
O. H. Greene	No par value In person	1
C. E. Schwarz	No par value In person	1
H. H. Utley	No par value By proxy, J. A. Caselton	1
J. A. Caselton	No par value In person	9,996
J. A. Caselton	Preferred In person	4,000

Mr. Geo.O.Carpenter, President of the Company, was duly elected chairman of the meeting and Mr. J. A. Caselton acted as secretary of the meeting.

The Chairman laid before the meeting the following written proposition of St. Louis Smelting & Refining Company:

"Rico Mining & Reduction Company,  
722 Chestnut Street,  
Saint Louis, Missouri.

Gentlemen:-

The undersigned, St.Louis Smelting & Refining Company, hereby submits to you the following proposition:-

That, if your Company will convey to the St.Louis Smelting & Refining Company all of the property and assets owned by your Company including all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado or elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights, St. Louis Smelting & Refining Company will assume and pay all current debts and obligations of Rico Mining & Reduction Company (except capital stock liability).

Yours very truly,  
ST.LOUIS SMELTING & REFINING COMPANY,

(signed) J. A. Caselton,  
Vice President. "

Page 2.

On motion, duly made and seconded, the following resolution was submitted to the meeting:-

RESOLVED, that this Company accept the foregoing proposition of St. Louis Smelting & Refining Company and that this Company convey to said St. Louis Smelting & Refining Company all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado or elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights in consideration of the assumption by said St. Louis Smelting & Refining Company of the obligation to pay all current debts of this Company (except capital stock liability).

This resolution was put to a viva voce vote of the shareholders and upon canvassing the vote it appeared that all of the shareholders had voted in favor of the same and that none had voted against it.

The Chairman thereupon declared that the said resolution had been duly adopted.

Thereupon, on motion duly made and seconded, the following resolution was submitted to the meeting:-

Whereas, after this Company shall have conveyed all of its properties and assets to St. Louis Smelting & Refining Company, as heretofore authorized by the shareholders at this meeting, the Company will have no property or assets with which to continue in business;

No, therefore, be it

RESOLVED, that the Board of Directors of this Company be and it hereby is authorized and directed to cause the dissolution of the corporate existence of this Company at such time and in such manner as said Board in its discretion may deem advisable.

Said resolution was put to a viva voce vote of the shareholders and upon canvassing the vote it appeared that all of the shareholders had voted in favor of the same and that none had voted against it.

The Chairman, thereupon, declared that said resolution had

Page 3.

been duly adopted.

There being no further business before the meeting, the same was, on motion duly made and seconded, adjourned.

  
Secretary.

MINUTES OF SPECIAL MEETING OF DIRECTORSofRICO MINING & REDUCTION COMPANY

A Special Meeting of the Directors of the Rico Mining & Reduction Company was held in Room 812 International Life Building, 722 Chestnut Street, Saint Louis, Missouri, on April 26, 1927, at the hour of two o'clock P.M., pursuant to notice duly given, at which were present the following Directors constituting a quorum; viz: Geo. O. Carpenter, O. H. Greene, C. E. Schwarz, J.A. Caselton; absent, H. H. Utley.

Mr. Geo. O. Carpenter, President of the Company, acted as Chairman of the meeting, and Mr. J. A. Caselton acted as Secretary of the meeting.

The Chairman laid before the meeting minutes of a special meeting of the shareholders of this Company held this morning in Room 812 International Life Building, 722 Chestnut Street, Saint Louis, Missouri, and called attention to the action taken thereat by the shareholders.

On motion of Mr. Greene, seconded by Mr. Schwarz, the following resolution was unanimously adopted:-

RESOLVED, that pursuant to the action taken by the shareholders at a meeting this day held, the following proposition of St. Louis Smelting & Refining Company be and the same is hereby accepted; viz:

"Rico Mining & Reduction Company,  
722 Chestnut Street,  
Saint Louis, Missouri.

Gentlemen:-

The undersigned, St. Louis Smelting & Refining Company, hereby submits to you the following proposition:

That, if your Company will convey to the St. Louis Smelting & Refining Company all of the property and assets owned by your Company including all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado, or



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elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights, St. Louis Smelting & Refining Company will assume and pay all current debts and obligations or Rico Mining & Reduction Company (except capital stock liability).

Yours very truly,

ST. LOUIS SMELTING & REFINING COMPANY,

(signed) J. A. Caselton,  
Vice President. "

and be it further

RESOLVED, that this Company convey to said St. Louis Smelting & Refining Company all mining properties, mining claims, plants, equipment, supplies, inventories, personal properties, all leases and/or leases and bonds on mining claims and/or mining properties situated in Dolores County, Colorado, or elsewhere, and all other property of whatsoever kind and wheresoever situated and all current accounts and/or bills receivable, contracts, stocks, right of way grants, franchises and/or rights in consideration of the assumption by said St. Louis Smelting & Refining Company of the obligation to pay all current debts of this Company (except capital stock liability);

and be it further

RESOLVED, that the proper officers of this Company be and they hereby are authorized to make, execute, enseal, acknowledge and deliver on behalf of this Company all appropriate deeds, assignments, bills of sale and/or other instruments in writing to said St. Louis Smelting & Refining Company and to do all other acts and things necessary and proper to effectuate the intents and purpose of this resolution.

On motion of Mr. Greene, seconded by Mr. Schwarz, the following resolution was unanimously adopted:

RESOLVED, that after this Company shall have conveyed to St. Louis Smelting & Refining Company all of its property and assets, as heretofore authorized by the shareholders and by this Board, its corporate existence be dissolved at such time and in such manner as may be directed by the officers of this Company;

and be it further

RESOLVED, that whenever the officers of this Company deem it advisable to dissolve the corporate existence of this Company the proper officers of this Company be and they hereby are authorized and directed to take all steps and to do all acts and things necessary and proper to dissolve the corporate existence of this Company.

There being no further business before the meeting, the same, on motion duly seconded, adjourned.

MINUTES OF MEETING OF DIRECTORS OF  
THE RICO MINING & REDUCTION COMPANY.

A meeting of the newly elected directors of The Rico Mining & Reduction Company was held at the office of the Company, 722 Chestnut Street, St. Louis, Missouri, on April 1, 1939, commencing at the hour of 2:00 o'clock P.M., pursuant to agreement of the directors, at which all of the directors constituting a quorum were present, as follows:

Jean McCallum,  
Howard H. Utley  
Charles A. Grisham  
Clarence Wilson  
Oliver S. Meyer

Mr. Jean McCallum was duly elected Chairman of the meeting, and Mr. Charles A. Grisham acted as Secretary of the meeting.

The Chairman stated that the meeting was called to elect officers to serve for the ensuing year and until their successors were duly elected and qualified.

On motion duly made, seconded and carried, the following persons were placed in nomination to fill the offices set opposite their names, respectively:

Jean McCallum,	President,
Howard H. Utley,	Vice President
Charles A. Grisham,	Secretary and Treasurer

There being no further nominations, the Secretary of the meeting was instructed to cast the ballot of the Board in favor of the election of the individuals above named to fill the offices set opposite their names, respectively, which resulted in their election.

The Chairman thereupon declared that said individuals were duly elected to the offices set opposite their names, respectively, to serve for the ensuing year and until their successors are duly elected and qualified.

The Chairman called attention to the resolutions adopted at special meetings of the stockholders and directors of this Company held on April 26, 1927, accepting a proposition of the St. Louis Smelting & Refining Company, and further called attention to the fact that some of the property which

this Company had contracted to convey to said St. Louis Smelting & Refining Company had not been included in certain conveyances heretofore executed by this Company to that Company.

After a discussion of the subject the following resolution was, on motion duly made and seconded, unanimously adopted:

RESOLVED, that Jean McCallum, as President of this Company, and Charles A. Grisham, as Secretary of this Company, be and they are hereby authorized, empowered and directed to make, execute and deliver, with all convenient speed, all deeds, conveyances or other instruments in writing necessary, convenient and proper to convey to St. Louis Smelting & Refining Company all property formerly owned by this Company still standing in its name on its records to the St. Louis Smelting & Refining Company; and be it further

RESOLVED, that the proper officers of this Company be and they are hereby authorized, empowered and directed to do all acts and things necessary and proper to effectuate the intents and purposes of the action taken by the stockholders and directors of this Company at their meetings held on April 26, 1927, as aforesaid, and of this resolution.

There being no further business before the meeting, the same was, on motion duly made, seconded and carried, adjourned.

Jean McCallum  
Chairman

Attest:

Charles A. Grisham  
Secretary

MINUTES OF MEETING OF STOCKHOLDERS OF  
THE RICO MINING & REDUCTION COMPANY.

A meeting of the stockholders of The Rico Mining & Reduction Company was held at the office of the Company, 722 Chestnut Street, St. Louis, Missouri, on April 1, 1939, commencing at the hour of 9:00 o'clock A.M., pursuant to notice given to, and consent signed by, all the stockholders, which are made part of these minutes.

The following shareholders constituting a quorum were present in person, viz.:

<u>Name</u>	<u>Class of Stock</u>	<u>No. of Shares</u>
Jean McCallum	Common	9,996
Jean McCallum	Preferred	4,000
Howard H. Utley	Common	1
Charles A. Grisham	Common	1
Clarence Wilson	Common	1
Oliver S. Meyer	Common	1

Mr. Jean McCallum was duly elected Chairman of the meeting, and Mr. Charles A. Grisham acted as Secretary of the meeting.

The Chairman stated that the business before the meeting was to elect a Board of Directors to serve for the ensuing year and until their successors were duly elected and qualified.

On motion duly made, seconded and carried, a vote by ballot for directors was dispensed with, and it was agreed that viva voce vote be taken.

Thereupon, on motion duly made, seconded and carried, the following persons were placed in nomination to fill the office of Directors, viz.:

Jean McCallum  
Howard H. Utley  
Charles A. Grisham  
Clarence Wilson  
Oliver S. Meyer.

There being no further nominations, the Secretary of the meeting was instructed to take the vote of all the stockholders present, and a canvass thereof showed that 10,000 shares of common and 4,000 shares of preferred stock, being all the shares of the

capital stock of the Company now outstanding, were cast in favor of the persons nominated, which resulted in their election.

The Chairman thereupon declared that said individuals were duly elected to serve as Directors of the Company for the ensuing year and until their successors were duly elected and qualified.

There being no further business before the meeting, the same was, on motion duly made, seconded and carried, adjourned.

Before me, notary public, the foregoing was read and attested.

Witness my hand and seal this 1st day of April, 1911.

Jean McCallum  
Chairman

Attest:

Charles A. Graham  
Secretary

The undersigned, a notary public in and for the State of New York, do hereby certify that the foregoing is a true and correct copy of the foregoing notice of the meeting of the Board of Directors of the Company, and the minutes of the meeting of said Board of Directors, and for the purposes therein specified, hereby giving any other form of notice or return of service to the parties to the law of the State of New York, the by-laws of the Company as aforesaid.

Jean McCallum  
Charles A. Graham  
Charles A. Graham  
Charles A. Graham  
Charles A. Graham  
All of the Directors

being elected and qualified.  
only elected to serve as Directors of the Company for the ensuing  
year. The Corporation declared that said individuals were  
of the persons nominated, which resulted in their election.  
subject stock of the Company now outstanding, were cast in favor

of the Rico Mining & Reduction Company, will be held at the  
of the Company, 722 Chestnut Street, St. Louis, Missouri, on the  
1st day of April, 1939, commencing at the hour of 9:00 o'clock  
A.M., for the purpose of electing a new Board of Directors and  
for the transaction of such other business as may be brought  
before the meeting.

Dated April 1, 1939.

Jean McCallum  
Stockholder.

The undersigned, constituting all the stockholders of  
The Rico Mining & Reduction Company, do hereby acknowledge to  
have received a copy of the foregoing notice of stockholders  
meeting, and do consent to the holding of such meeting at the  
time and place and for the purposes therein specified, hereby  
waiving any other form of notice, or manner of service thereof  
required by the laws of the State of Colorado, the by-laws of  
the Company or otherwise.

Jean McCallum  
H. S. Hickey  
Charles H. Hickey  
Oliver S. Meyer  
All of the Stockholders

December 19, 1942.

To the Directors of the  
Rico Mining & Reduction Company:

You are hereby notified that a special meeting of the Directors of the Rico Mining & Reduction Company will be held at Room 1500 International Building, 722 Chestnut Street, in the City of St. Louis, Missouri, on December 23, 1942, at the hour of 11:00 o'clock A.M., for the purpose of considering and acting upon directions which this Company has received from the St. Louis Smelting & Refining Company to which it is obligated to convey certain property in Dolores County, Colorado, regarding the abandonment of said property, and for the transaction of such other business as may be brought before the meeting.

*Jean McCallum*  
President.

The undersigned, being all the directors of the Rico Mining & Reduction Company, do hereby acknowledge to have received a copy of the foregoing notice of special directors meeting, and do hereby consent to the holding of said meeting at the time and place, and for the purpose therein specified, hereby waiving any other form of notice or manner of service thereof required by the statutes of the State of Missouri, the by-laws of the Company or otherwise, and hereby consenting to the transaction of any business that may be brought before the meeting.

*Jean McCallum*  
*H. H. L. L. L.*  
*W. H. L. L. L.*  
*W. H. L. L. L.*  
*Oliver S. Meyer*

All of the Directors

St. Louis, Mo., December 23, 1942.

A special meeting of the Board of Directors of the Rico Mining & Reduction Company was this day held at Room 1500 International Building, 722 Chestnut Street, in the City of St. Louis, Missouri, at the hour of 11:00 o'clock A.M., pursuant to notice and waiver attached to these minutes and made a part hereof, at which meeting a quorum was present, as follows:

Jean McCallum  
Howard H. Utley  
C. A. Grisham  
Clarence Wilson  
Olive S. Mayer

Jean McCallum, President of the Company, acted as Chairman of the meeting, and C. A. Grisham, Secretary of the Company, acted as Secretary of the meeting.

The Chairman called attention to the fact that heretofore on April 26, 1927, this Company had, by contract, agreed to convey all of its property to the St. Louis Smelting & Refining Company, but that all of said property then owned by this Company had not been actually conveyed and, as a consequence, record title thereto still remains in the name of this Company.

The Chairman further stated that this Company had received a request from St. Louis Smelting & Refining Company that in lieu of transferring said unconveyed property to St. Louis Smelting & Refining Company, that this Company join said St. Louis Smelting & Refining Company in abandoning all such property that now remains of record in the name of this Company.

After a discussion of the matter the following resolution was, on motion duly made and seconded, unanimously adopted:

WHEREAS, this Company has heretofore agreed to transfer and convey to St. Louis Smelting & Refining Company all of its properties in Dolores County, Colorado, but the record title to some of said properties has not yet been transferred to said St. Louis Smelting & Refining Company; and,

WHEREAS, said St. Louis Smelting & Refining Company being entitled to receive a conveyance of said properties from this Company, as aforesaid, has in lieu thereof directed this Company to take all steps necessary and proper to accomplish the abandonment of said properties in 1942.

NOW, THEREFORE, Be it

RESOLVED, that the officers of this Company be and



STATE OF TEXAS  
COUNTY OF DALLAS  
CITY OF DALLAS  
BOARD OF REALTORS

WHEREAS the Board of Realtors is organized as follows:

and whereas the Board of Realtors was organized as a body corporate and  
incorporated as the City of Dallas, Texas, and whereas the Board of Realtors  
is authorized by the City of Dallas, Texas, to execute all instruments and to do all acts and things  
necessary and proper to effectuate the abandonment in 1942  
of said properties.

A RESOLUTION PASSED BY THE BOARD OF REALTORS OF THE CITY OF DALLAS, TEXAS

they are hereby authorized, empowered and directed to  
execute all instruments and to do all acts and things  
necessary and proper to effectuate the abandonment in 1942  
of said properties."

There being no further business before the meeting, the  
same was, on motion duly made, seconded and carried, adjourned.

Jean McCallum  
Chairman

Attest:

Robert G. Smith  
Secretary

St. Louis, Mo., December 22, 1942.

TO WHOM IT MAY CONCERN:

You are hereby notified that the undersigned, ST. LOUIS SMELTING & REFINING COMPANY and RICO MINING & REDUCTION COMPANY, have abandoned all their right, title, interest and estate, respectively, in and to all of their mining and other property, including patented and unpatented lode mining claims, situated in the County of Dolores, State of Colorado, except the following:

Lots 5 and 6, Block 1, and Lot 30 and the North 19 feet of Lot 29, Block 6, of Rico, Colorado, together with improvements thereon, and except also the Argentine Patented Lode Mining Claim, U.S. Survey No. 15,233, and the undivided one-half interest of St. Louis Smelting & Refining Company in the Humboldt Patented Lode Mining Claim U.S. Survey No. 15,233.

IN WITNESS WHEREOF, the undersigned, ST. LOUIS SMELTING & REFINING COMPANY and RICO MINING & REDUCTION COMPANY have caused these presents to be executed by their respective Vice Presidents and their respective corporate seals to be hereunto affixed, attested by their respective Secretaries, all done this 22nd day of December, 1942.

ST. LOUIS SMELTING & REFINING COMPANY,

By Jean McCallum  
Vice President

Attest:

Charles A. Grisham  
Secretary

RICO MINING & REDUCTION COMPANY,

By Howard H. Utley  
Vice President

Attest:

Charles A. Grisham  
Secretary

STATE OF MISSOURI )  
CITY OF ST. LOUIS ) SS

The foregoing instrument was acknowledged before me this 22nd day of December, 1942, by Jean McCallum and Charles A. Grisham, Vice President and Secretary, respectively, of St. Louis Smelting & Refining Company.

Witness my hand and official seal.

My commission expires Sept. 23, 1944

Ellen M. Oppenbecher  
Notary Public

STATE OF MISSOURI )  
CITY OF ST. LOUIS ) SS

The foregoing instrument was acknowledged before me this 22nd day of December, 1942, by Howard H. Utley and Charles A. Grisham, Vice President and Secretary, respectively, of Rico Mining & Reduction Company.

Witness my hand and official seal.

My commission expires Sept. 23, 1944

Ellen M. Oppenbecher  
Notary Public

# RECORD OF PROCEEDINGS

100 LEAFS

WHEREAS, the National Lead Company, a corporation organized under the laws of the State of Missouri, has been holding record title to and operating certain properties in Dolores County, Colorado, together with improvements thereon, and has received directions from its said principal, National Lead Company, to abandon said properties, with certain minor exceptions; and, WHEREAS, this Company has heretofore acquired from Rico Mining & Reduction Company all of its property in said County of Dolores, State of Colorado, but at that time the record title to some of said property was not conveyed to this Company and, as a consequence, remains in the name of said Rico Mining & Reduction Company. The resolution adopted at a meeting of the Board of Directors of the St. Louis Smelting & Refining Company, the following resolution was adopted:

Dear Sirs: We, the undersigned, do hereby certify that at a meeting of the Board of Directors of the St. Louis Smelting & Refining Company, the following resolution was adopted:

WHEREAS, this Company, as agent of National Lead Company, has been holding record title to and operating certain properties in Dolores County, Colorado; and,

WHEREAS, this Company has received directions from its said principal, National Lead Company, to abandon said properties, with certain minor exceptions; and,

WHEREAS, this Company has heretofore acquired from Rico Mining & Reduction Company all of its property in said County of Dolores, State of Colorado, but at that time the record title to some of said property was not conveyed to this Company and, as a consequence, remains in the name of said Rico Mining & Reduction Company.

NOW, THEREFORE, Be it

RESOLVED, that the officers of this Company be and they are hereby authorized, empowered and directed, for and on behalf of this Company, as agent of said National Lead Company, to abandon all right, title, interest and estate of National Lead Company and of this Company as such agent in and to said properties (with the exceptions specified in the directions of National Lead Company) in Dolores County, Colorado, in 1942; and be it further

RESOLVED, that Rico Mining & Reduction Company be and it is hereby directed, in lieu of conveying to this Company any of such property still remaining on record in the name of said Rico Company, to take all steps necessary and proper to accomplish the abandonment of said properties in 1942; and be it further

RESOLVED, that the officers of this Company be and they are hereby authorized, empowered and directed to execute all instruments and to do all acts and things necessary and proper to effectuate the intents and purposes of this resolution."

In accordance with the resolution of said Company, your Company is hereby authorized and directed to proceed with the abandonment of all property, the record title to which still stands in the name of your Company and to do all acts and things necessary and proper to accomplish such abandonment.

Yours truly,

ST. LOUIS SMELTING & REFINING COMPANY,

By

*John McCollum*  
Vice President

# EPA Notification of Hazardous Waste Site

United States  
Environmental Protection  
Agency  
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

## A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name NL Industries, Inc.  
Street P.O. Box 1090 (Wyckoff-Mills Road)  
City Hightstown State NJ Zip Code 08520

## B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site LaMotte Mine  
Street \_\_\_\_\_  
City Rico County Dolores State CO Zip Code \_\_\_\_\_

## C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title) Baser, F.R., Dir. Environmental Control  
Rodman, H.G., Environmental Engineer  
Phone 609/443-2411 or 2410

## D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year) 1927 To (Year) 1944

## E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:  
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☒ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☒ Other (Specify)

Mine wastes

Source of Waste:  
Place an X in the appropriate boxes.

1. ☒ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:

EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.




Notification of Hazardous Waste Site	Side Two																			
<b>F Waste Quantity</b> Place an X in the appropriate boxes to indicate the facility types found at the site. In the "total facility waste amount" space, give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons. In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.	<b>Facility Type</b> 1 <input type="checkbox"/> Piles 2 <input type="checkbox"/> Land Treatment 3 <input type="checkbox"/> Landfill 4 <input type="checkbox"/> Tanks 5 <input type="checkbox"/> Impoundment 6 <input type="checkbox"/> Underground Injection 7 <input type="checkbox"/> Drums, Above Ground 8 <input type="checkbox"/> Drums, Below Ground 9 <input checked="" type="checkbox"/> Other (Specify) <u>Unknown</u>	<b>Total Facility Waste Amount</b> cubic feet <u>Unknown</u> gallons _____ <b>Total Facility Area</b> square feet <u>Unknown</u> acres _____																		
<b>G Known, Suspected or Likely Releases to the Environment:</b> Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment. <input type="checkbox"/> Known <input type="checkbox"/> Suspected <input type="checkbox"/> Likely <input checked="" type="checkbox"/> None <b>Note:</b> Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.																				
<b>H Sketch Map of Site Location: (Optional)</b> Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.																				
<b>I Description of Site: (Optional)</b> Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions. <div style="text-align: center; font-size: 1.2em; margin-top: 20px;">Notification based on presumed storage of mine wastes, and uncertainty regarding coverage of the statute</div>																				
<b>J Signature and Title:</b> The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".																				
<table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Name <u>F. R. Baser</u></td> <td style="width: 40%;"><input type="checkbox"/> Owner, Present</td> <td style="width: 30%;"></td> </tr> <tr> <td>Street _____</td> <td><input checked="" type="checkbox"/> Owner, Past</td> <td></td> </tr> <tr> <td>City _____</td> <td><input type="checkbox"/> Transporter</td> <td></td> </tr> <tr> <td>State _____ Zip Code _____</td> <td><input type="checkbox"/> Operator, Present</td> <td></td> </tr> <tr> <td>Signature <u>Fred Baser</u> Date <u>6/8/81</u></td> <td><input checked="" type="checkbox"/> Operator, Past</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> Other</td> <td></td> </tr> </table>			Name <u>F. R. Baser</u>	<input type="checkbox"/> Owner, Present		Street _____	<input checked="" type="checkbox"/> Owner, Past		City _____	<input type="checkbox"/> Transporter		State _____ Zip Code _____	<input type="checkbox"/> Operator, Present		Signature <u>Fred Baser</u> Date <u>6/8/81</u>	<input checked="" type="checkbox"/> Operator, Past			<input type="checkbox"/> Other	
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